The Bus That Never Was

Duncan MacAuslan and Basil Hancock

The Sydney Bus Museum (SBM) owns a superb collection of buses telling the story of public road transport in Sydney and New South Wales, ranging from the small bonneted buses of the 1920s to a modern low floor CNG bus. The collection, which includes an operational London RT and a Routemaster, not to mention a former Trent (England) lowbridge Atlantean used as a school bus for many years, is housed in a former tramway workshop in the inner Sydney suburb of Leichhardt and is well known for its regular operation of Sydney's iconic double deck buses on the city's streets.

The SBM's archivist Duncan MacAuslan describes a radical 1947 proposal for a new design of double deck bus which, if built, would have been a world leader and would have made a magnificent addition to the museum's collection.

The Discovery

In 1994 an eagle-eyed Sydney bus driver on State Transit route 409 in Shaftesbury Road, Burwood spied what appeared to be a large children's toy, which looked like a double deck bus, but damaged and put out on the footpath ready for the Council clean-up.

He reported the find to well-known Australian bus enthusiast, photographer and author Greg Travers who, most fortunately at the time, was the Operations Manager at Burwood Depot. Immediately, he summoned a mobile Inspector who found and retrieved the treasure.

A copy of Greg's publication, *City to Suburb…..a 50 year journey*, was consulted and on page 77 there was a general arrangement drawing which matched the white plaster model. Talented depot tradesmen Jim Clark, a body builder and Ted Royston, a master painter set to work to restore the model in between core work.

1 A FRONT NEARSIDE VIEW OF THE MODEL AS DISPLAYED IN THE SYDNEY BUS MUSEUM IN THE DRTT LIVERY OF THE ERA. THE VERY MODERN DESIGN, BOTH IN LAYOUT AND STYLING, IS OBVIOUS AND IF THIS BUS HAD BEEN BUILT IT WOULD HAVE BEEN AHEAD OF ANYTHING ELSE AT THE TIME. NOTE THE SIMILARITY OF THE FRONT RADIATOR GRILLE TO THE LATER AEC DESIGN USED IN THE REGENT V AND OTHER BUSES AND TRUCKS. IF COMENG HAD REGISTERED THE DESIGN THEY COULD HAVE SUED AEC FOR INFRINGEMENT OF COPYRIGHT. (DUNCAN MACAUSLAN)

2 A REAR OFFSIDE VIEW OF THE MODEL AS DISPLAYED IN THE SYDNEY BUS MUSEUM IN THE DRTT LIVERY OF THE ERA. THE LOCATION OF THE TWO STAIRCASES IS CLEAR, AS ARE THE UPPER AND LOWER DECK EMERGENCY WINDOWS. THE DRIVER WOULD HAVE BEEN PROVIDED WITH A SEPARATE CAB DOOR. (DUNCAN MACAUSLAN)

3 THE HANDOVER OF THE RESTORED COMENG DD/71 MODEL TO THE SYDNEY BUS & TRUCK MUSEUM (AS IT WAS THEN NAMED) IN 1997. LEFT TO RIGHT ARE BODYBUILDER JIM CLARK, MASTER PAINTER TED ROYSTON, BURWOOD OPERATIONS MANAGER JAMIE SINCLAIR, BROOKVALE OPERATIONS MANAGER GREG TRAVERS AND SENIOR BUS OPERATOR TRAINER MALCOLM MORGAN. THE BUS WAS GIVEN THE FLEET NUMBER 1950 TO REPRESENT THE YEAR WHEN THE FIRST OF THE BUSES COULD HAVE ENTERED SERVICE. (GREG TRAVERS)

In 1997, after Greg had moved to Brookvale Depot, the restoration was finished and painted. Jim and Ted along with the Burwood Operations Manager Jamie Sinclair presented the model to the then Bus and Truck Museum, represented by Greg and Senior Bus Operator Trainer, Malcolm Morgan. It is now a prized exhibit in the SBM.

Before describing the bus it is necessary to look at passenger road transport in Sydney as it was in 1947.

Sydney Road Transport in 1947

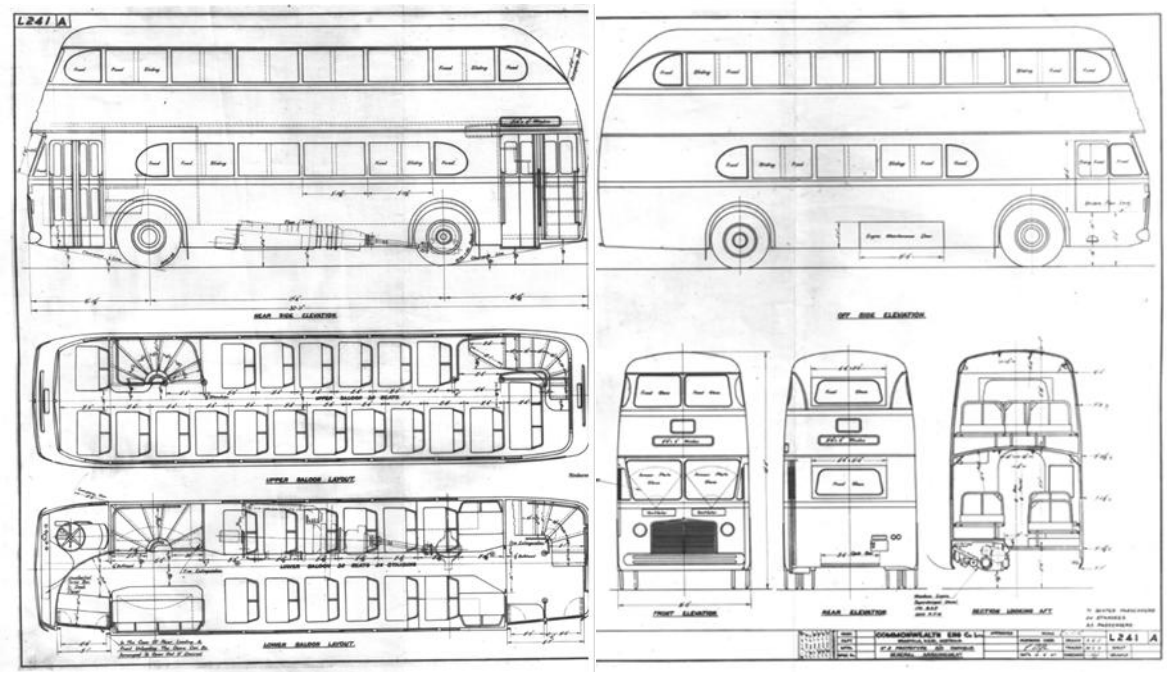
4 A TYPICAL OPERATION OF SYDNEY DOUBLE DECKERS, IN THIS CASE CELEBRATING THE 150TH ANNIVERSARY OF THE NSW GOVERNMENT RAILWAYS AT CENTRAL STATION ON 25 SEPTEMBER 2005. AEC REGENT III-COMMONWEALTH ENGINEERING 2352 IS FOLLOWED BY 1947-BUILT ALBION VENTURER CX19W-CLYDE 1892 AND LEYLAND ATLANTEAN PDR1A/1-PRESSEDMETAL 1003. THE ALBION WAS BUILT IN THE SAME YEAR AS THE COMENG DD/71 PROPOSAL WAS ISSUED, DEMONSTRATING HOW ADVANCED THE CONCEPT WAS. (BASIL HANCOCK)

In 1947 Sydney possessed the largest tram system in the Southern hemisphere, and the second largest in the British Commonwealth. There were around 1600 trams operating over more than 150 miles of routes and carrying around 400 million passengers a year. Operated by the New South Wales State Government as the Department of Road Transport and Tramways (DRTT) it was complemented by a fleet of around 800 buses, mainly double deck AEC Regents, Albion Venturers and Leyland Titans, with distinctive standardised bodies by Comeng and Clyde, with a lesser number of half cab single deckers also on British chassis.

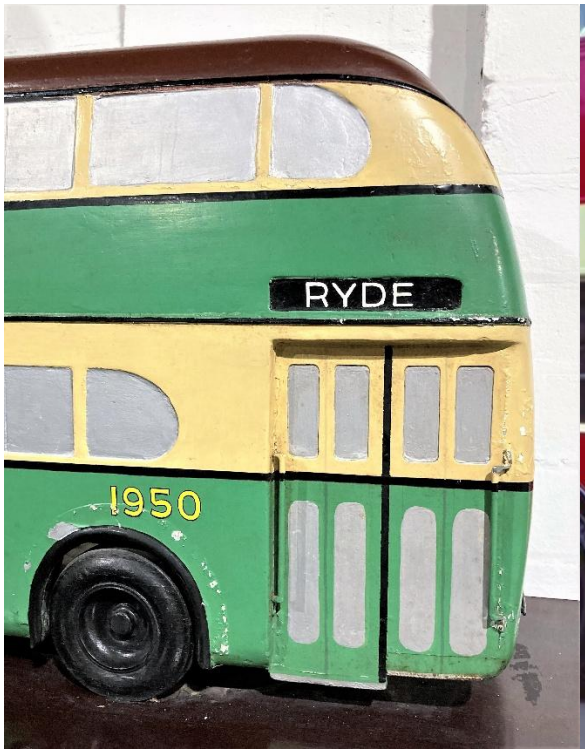
The Comeng Proposal

Commonwealth Engineering, usually known as Comeng, was a major railway rolling stock manufacturer based in the Sydney suburb of Granville, around 25 kilometres west of the city centre. In addition, it built trams for Sydney and bodied many double deck and a lesser number of single deck buses for the DRTT as well as some buses for private operators. Interestingly Clyde Engineering, which built most of the other DRTT bodies, was literally just across the railway tracks from Comeng. Comeng closed down in the late 1980s, one of its last products having been a fleet of XPT passenger trains, based very closely on the British Rail HST, which are still in operation.

In June 2022 a rather tatty pink folder was found in the SBM archives labelled "*Comeng Double Deck Bus Type No. DD/71*" and rubber stamped "*Maintenance Engineer (Omnibus)*". Inside was a copy of Comeng's 1947 "*General specification of the proposed new omnibus to be built by the company*".



5 COMMONWEALTH ENGINEERING DRAWING L241/A, DATED 12 JUNE 1947, SHOWING THE LAYOUT OF THE PROPOSED UNDERFLOOR-ENGINED DOUBLE DECK BUS FOR THE DRTT IN SYDNEY. THE RADICAL LAYOUT WITH ITS FRONT AND REAR DOORWAYS AND STAIRCASES IS TO BE NOTED. THE ENGINE IS UNDER THE OFFSIDE OF THE LOWER DECK FLOOR JUST BEHIND THE FRONT STAIRCASE. OF PARTICULAR NOTE IS THE SPLIT-STEP REAR ENTRANCE WHICH WAS PROPOSED MORE THAN A DECADE BEFORE EASTERN COACHWORKS FIRST USED IT ON SOME BRISTOL LODEKKAS FOR BRIGHTON HOVE AND DISTRICT AND A QUARTER OF A CENTURY BEFORE SOUTH YORKSHIRE PTE "INVENTED" IT. (GREG TRAVERS COLLECTION)



6 LEFT: THE SPLIT LEVELS OF THE MODEL (DUNCAN MACAJSLAN)

7RIGHT: THE REAR PLATFORM OF BRIGHTON HOVE AND DISTRICT BRISTOL LODEKKA FS6B-ECW 54 SHOWING THE SPLIT-LEVEL ENTRANCE STEP FITTED TO A FEW OF THESE BUSES. THIS IS ALMOST EXACTLY THE SAME LAYOUT AS PROPOSED BY COMENG FOR THE DD/71, ALTHOUGH THE COMENG BUS WOULD HAVE HAD PLATFORM DOORS AND AN ADDITIONAL TRANSVERSE STEP UP INTO THE LOWER DECK. COSTS. (BASIL HANCOCK COLLECTION)

The design endeavoured to incorporate the best features of bus manufacture and Comeng's experience in bodybuilding to produce a bus ideally suited to Australian conditions. The bus was to have high capacity (71 seats) and performance but low maintenance The dimensions were:

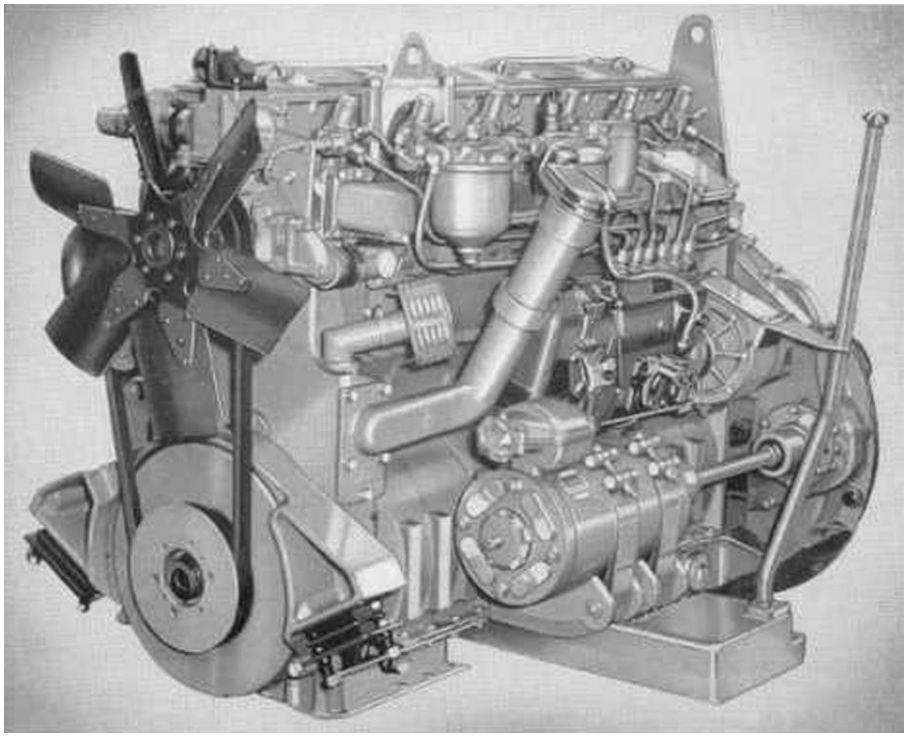
- Overall length: 33ft 0in (10.07m)
- Wheelbase: 17ft 6in (5.34m)
- Rear overhang: 8ft 6in (2.59m)
- Front overhang: 7ft 0in (2.14m)
- Overall height: 14ft 4in (4.37m)
- Overall width: 8ft 0in(2.44m).

8 THIS SKETCH OF COMENG'S 1947 PROPOSAL FOR AN UNDERFLOOR-ENGINED DOUBLE DECK BUS WITH MEADOWS ENGINE DEMONSTRATES THE (THEN) CONSIDERABLE LENGTH OF THE BUS AND ITS VERY MODERN STYLING. (GREG TRAVERS COLLECTION)

The body had an entrance forward of the front axle, and a second at the rear, both with automatic folding doors. There were two staircases, one in the traditional rear corner location and a second behind the driver ascending towards the back. The bus was to be suitable for 'Pay As You Enter' operation with the doors operated by either the driver or the conductor. Although perhaps not considered such a radical layout today, remember that this was 1947.

The driver's cabin was designed to provide easy steering and full vision. It was accessible from the saloon as well as having an emergency exit. Steering was to be assisted by a Westinghouse Pneumatic Steering Booster – this was an addition to the original specification as evidenced by the typing. The steering was to be either Marles or Gemmer cam and roller with a 22inch (560mm) diameter steering wheel.

The bus was to be an integral structure instead of the traditional separate chassis and body units. The structural members were to be of high tensile steel electrically welded into a single unit. This was based on contemporary American design practice.



9 A MEADOWS 6DC-630 10.35 LITRE DIESEL ENGINE. IT IS MOST LIKELY THAT A HORIZONTAL SUPERCHARGED VERSION OF THIS ENGINE WAS INTENDED FOR THE COMENG DD/71. (BASIL HANCOCK COLLECTION)

The 170hp supercharged diesel motor was to be sourced from Henry Meadows Ltd in England and was to be laid horizontally under the offside lower saloon seats. The radiator was at the front with an air-cooling fan driven by an extension shaft from the engine. The grille was of light stainless-steel construction.

A Vulcan Sinclair hydraulic coupling, or fluid flywheel, was incorporated. The gearbox was to be a Wilson, four forward, one reverse speed, epicyclic self-changing gear box. This permitted automatic gear changing at selected speeds and could also be operated manually. Gear ratios were specified as first 4.07, second 2.42, third 1.6 and fourth 1 to 1. Reverse was 5.92 to 1.

Harvey Spicer needle roller bearing universal joints were specified. The front axles were of a drop-forged Kirkstall type. The rear Kirkstall type having an offset bowl, demountable carrier, fully floating with a final ratio of 7.25 to 1. Springs were to be Selecon chrome alloy steel plate leaf half-elliptic type fitted with rubber cushioned shackle pins. Shock absorbers were to be fitted where necessary.

Stabilisers were to be fitted at the front and rear to reduce sway on corners and, combined with the low centre of gravity, would reduce the possibility of overturning.

Westinghouse pressure air-brakes (sic) with large drums were intended to provide adequate braking in all operating conditions.

The electrical system was to be 24 volts.

Seating was to be lighter than was in current use with cellular rubber covered with leather coloured to the Department's tone. The floor was to be malthoid, windows of safety glass,

fixed windscreens set in rubber, ventilation adjustable, with a chrome plated front bumper bar, stainless steel hand rails and grab bars and full-sized destination screens.

Added to the description was a list of 'Special Economic Points'. 71 seats was 17% more passengers than existing buses so 87 of these buses replaced 100 existing ones. This would reduce wages by at least 34 driver and conductor shifts a day. The DD/71's price would probably be comparable on a per passenger to capital basis. Service maintenance 'should' be cheaper due to access from underneath.

Operationally the extra door would reduce loading and unloading time and save on fuel and running times. Weight per passenger was lower again, reducing fuel requirements. Use of stainless steel and fixed windows would considerably reduce maintenance costs. The integral body would require less maintenance, and the larger brake drum area would reduce costs as well.

The pack was accompanied by the layout drawing, shown later in John Dunn's magnificent five-volume history of Comeng, and a concept drawing in which the bus in many ways foreshadowed London's New Routemaster.

10 A FLOAT DISPLAYING MODELS OF COMMONWEALTH ENGINEERING PRODUCTS, BELIEVED TO BE IN A SYDNEY WARATAH FESTIVAL PARADE IN THE LATE 1940S. AMONGST THE TRAIN, TRAM AND BUS MODELS THE DD/71 MODEL TAKES PRIDE OF PLACE. (RON DRUMMOND FROM THE GREG TRAVERS COLLECTION)

In 1949 three London Transport senior managers had, at the request if the State Government, prepared a report, the Sinclair, Andrews, Ellen Report, into the DRTT. Amongst its many recommendations was one which said that the underfloor-engined

Meadows-engined diesel double decker should be adopted, with an intention of replacing the O-Class trams of which there were 615 in 1952, by the end of December 1954. Sadly the DRTT and its government owners were not as progressive in their thinking as Comeng, the recommendation was not adopted and the project was shelved, never to be revived. Instead, after the delivery of its last front-engined double deckers in 1953 the DRTT turned to underfloor-engined AEC Regal IVs, Leyland Royal Tigers and later on Worldmasters and Leopards. It would finally buy some front-entrance double deckers in the shape of 224 Leyland Atlanteans in 1970-1972.

However, by a stroke of good fortune the plaster model, whose existence was previously unknown, was recovered and restored as previously mentioned and provides a lasting reminder of this groundbreaking concept. Where it had been all of those years and how it came to be sitting in a domestic rubbish pile in suburban Burwood will probably never be known.

The AEC Q in Sydney

11 DRTT 165, THE THIRD OF THE THREE DRTT DOUBLE-DECK AEC Q BUSES (163-165), APPARENTLY ON TEST PRIOR TO ENTERING SERVICE IN 1934. ALL THREE BUSES INITIALLY HAD PETROL ENGINES BUT WERE LATER FITTED WITH DIESELS. THE FRONT ENTRANCE BODIES WERE BUILT BY SYD WOOD AND WERE LARGELY, AND MOST APPROPRIATELY, WOODEN FRAMED. THEY WERE WITHDRAWN IN 1949. (GREG TRAVERS COLLECTION)

12 THE THREE DRTT AEC Q DOUBLE DECKERS 163, 164 AND 165 ARE SEEN OUT OF USE AT RANDWICK WORKSHOPS IN 1947, ALTHOUGH NOT OFFICIALLY WITHDRAWN UNTIL 1949. 164 IN THE CENTRE HAS BEEN FITTED WITH A FRONT MOUNTED RADIATOR IN AN EFFORT TO OVERCOME THE COOLING PROBLEMS WHICH AFFLICTED THE Q MODEL, ESPECIALLY IN SYDNEY'S WARMER CLIMATE. IT MAY NOT HAVE BEEN TOO SUCCESSFUL SINCE THE OTHER TWO BUSES WERE NEVER MODIFIED. (NORM BOXALL FROM THE GREG TRAVERS COLLECTION).

***13* THE DRTT ALSO HAD THREE SIMILAR AEC Q TROLLEYBUSES, OF WHICH THE FIRST (3) HAD A PARK ROYAL BODY AND THE OTHER TWO (4 AND 5) HAD SYD WOOD BODIES. NUMBER 5 IS SEEN HERE AT THE WYLDE STREET TERMINUS OF THE TOWN HALL TO POTTS POINT TROLLEYBUS ROUTE. NUMBER 3 WAS WITHDRAWN IN 1948 AFTER AN ACCIDENT WHILE THE OTHER TWO WERE TRANSFERRED TO THE KOGARAH ROUTES AFTER CLOSURE OF THE TOWN HALL ROUTE IN 1948 AND LASTED UNTIL 1956. WITH THE EXCEPTION OF THE GRIMSBY CENTRE ENTRANCE Q, THESE WERE THE LAST DOUBLE DECK QS TO REMAIN IN SERVICE ANYWHERE. (JOHN BURGESS FROM THE GREG TRAVERS COLLECTION)**

These six vehicles meant that Sydney was the largest user of double deck AEC Q buses (even London Transport could only manage five), and their layout may in part have inspired the Comeng underfloor-engined design. However as with all Q chassis, the rear wheels (single, not double tyred), were at the extreme rear, with virtually no rear overhang, so a rear doorway and staircase could not be accommodated.

Later Underfloor Engined Double Deckers

14 The sole AEC Regent IV, with its horizontal underfloor engine located behind the front wheels, as originally built with its full front Crossley body. This bus was apparently too heavy and seemingly could not be licensed. Just like Leyland with its first Lowloader chassis, AEC combined a trolleybus-style front end with a traditional rear entrance, although the AEC had an off side cab door. The opening flaps show the location of the engine. (Basil Hancock Collection)

The first underfloor-engined British double decker was sole AEC Regent IV which appeared in 1950. The horizontal engine was located behind the front wheels, in a similar offside location to that in the Regal IV (i.e. as far towards the offside as possible). As originally built it was fitted with a full front rear entrance Crossley body. For whatever reason this combination did not receive a good reception, but while the poor response was apparently blamed on the body, the reality would appear to be that bus was apparently too heavy and probably could not be licensed.

15 The Regent IV chassis was soon rebodied with this Park Royal body and painted in Leeds City Transport livery as fleet number 800, possibly for the 1952 Commercial Motor Show. However Leeds never took delivery and a more conventional Roe-bodied Regent III appeared as 800 at the show in its place. (Basil Hancock Collection)

As a result of its poor initial reception the Regent IV chassis was very soon rebodied with a Park Royal body and painted in Leeds City Transport livery as fleet number 800, possibly for exhibition at the 1952 Commercial Motor Show. However, Leeds never took delivery and a more conventional Roe-bodied Regent III appeared as 800 at the show in its place. Apart from trials with a few operators the Regent IV never entered proper service and was scrapped at a very young age.

Just like Leyland with its first Lowloader chassis, AEC combined a trolleybus-style front end with a traditional rear entrance. Presumably after getting their fingers burnt with the Q nearly twenty years earlier, they were of the opinion that the market was not yet ready for another front entrance double decker.

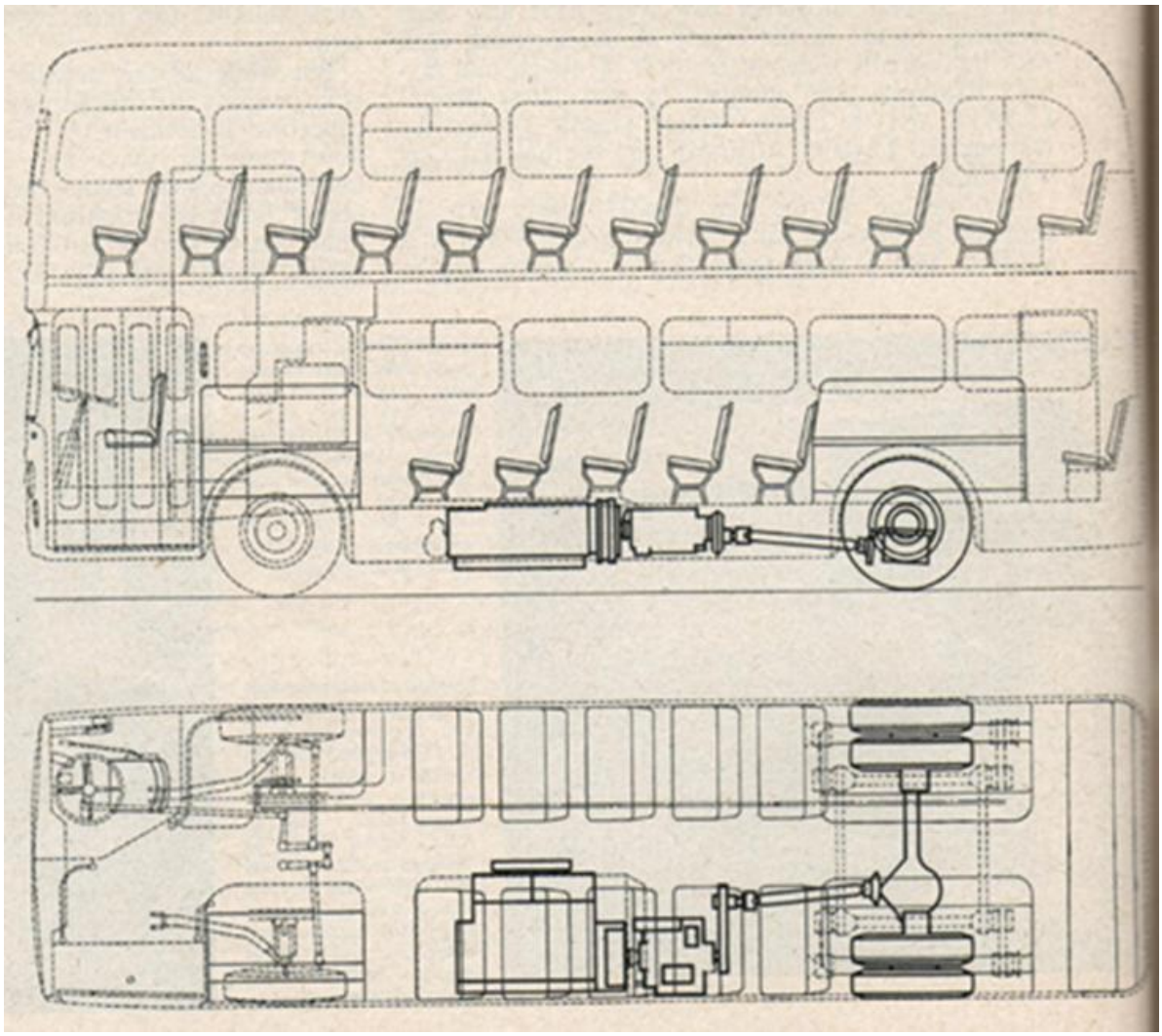
The Regent IV provided no major advantages over a conventional front engined bus, despite being heavier and more expensive, and the project quickly died. The more conventional Regent V would follow it and AEC would never build another front entrance double decker, unless the sole FRM, which was in reality largely a London Transport project, is counted.

16. 4943, THE FIRST OF THE TWO BMMO D10 UNDERFLOOR-ENGINED DOUBLE DECKERS IS SEEN TOWARDS THE END OF ITS WORKING LIFE ON A CHARTER AT WOLVERHAMPTON LOW LEVEL STATION ON 12 SEPTEMBER 1971. THE LOCATION OF THE UNDERFLOOT ENGINE IS OBVIOUS FROM THE HINGED FLAPS AND ACCESS HOLES IN THE LOWER BODYSIDE BEHIND THE FRONT WHEEL.

(BASIL HANCOCK)

Following the Regent IV BMMO (Midland Red) produced two underfloor-engined D10s in 1960/1961. Unlike the Comeng proposal, the engine was mounted on the nearside of the vehicle but unusually, to meet ground clearance regulations, with its cylinder heads facing inwards, as seen in the drawing. In many ways the D10 was a combination of features of the D9 double decker and the S14/S15 single deckers. It had a front entrance and a neat

layout on both decks with a single interior entrance step. Some nearside seats on the lower deck were on a raised plinth over the engine. The first bus, 4943, had a double width front entrance, but the second bus, 4944, initially had an additional single width rear doorway behind the rear axle and a second staircase in the rear offside corner, just as the Comeng DD/71 had. This did not last very long and the bus was soon converted to a front entrance only layout, although it retained its centre rear emergency exit door as a distinguishing feature from 4943 which had an offside door.



17 A LAYOUT DRAWING OF THE BMMO D10 SHOWING THE LOCATION OF THE ENGINE ON THE NEARSIDE WITH ITS CYLINDER HEADS FACING INWARDS. SEATS OVER THE ENGINE WERE MOUNTED ON A RAISED PLINTH. DUE TO THE OFFSET OF THE ENGINE A TRANSFER BOX, VISIBLE BEHIND THE GEARBOX, WAS NECESSARY TO BRING THE DRIVELINE CLOSER TO THE CENTRE OF THE BUS IN ORDER TO REACH THE REAR DIFFERENTIAL. (BASIL HANCOCK COLLECTION)

After trials around the network, both buses operated in service for around ten years, latterly based at Stafford, and fortunately 4943 still exists, preserved and operational at Wythall. For various reasons no more were built and production reverted to the front-engined D9.

18 THE SECOND D10, 4944, IS SEEN WHEN NEW WITH ITS ADDITIONAL REAR DOORWAY AND SECOND STAIRCASE, BOTH OF WHICH WERE SOON REMOVED. DESPITE THE UNDERFLOOR ENGINE A MORE ACCEPTABLE FRONT ENTRANCE WAS PROVIDED THAN ON CONTEMPORARY SINGLE DECKERS. THE ORIGINAL LAYOUT OF THIS BUS WAS SIMILAR TO THE COMENG PROPOSAL. (BASIL HANCOCK COLLECTION)

19 LONDON TRANSPORT'S ONLY VOLVO CITYBUS, ALEXANDER-BODIED C1, IS SEEN AT EAST FINCHLEY STATION ON ROUTE 102 ON 6 MAY 1987. WHEN NEW TWO YEARS EARLIER THIS BUS HAD BEEN FITTED WITH THE CUMULO ENERGY STORAGE SYSTEM IN WHICH BRAKING ENERGY WAS CAPTURED AND STORED TO ASSIST IN LATER ACCELERATION FROM REST. BY THIS TIME THE SYSTEM HAD BEEN DISCONNECTED AND THE BUS WAS OPERATING AS A CONVENTIONAL DIESEL BUS. TODAY THE SAME EFFECT IS PROVIDED IN ELECTRIC BUSES BY REGENERATIVE BRAKING WITH THE ENERGY RETURNED TO THE BATTERIES. (BASIL HANCOCK)

It took until the 1980s for the underfloor-engined double deck to appear in volume in the UK. The first model to appear was from Volvo, which at various times carried the designations B10MD, D10M and Citybus. It was closely derived from the B10M chassis, and the relatively low frame permitted by its dry sump engine provided a fairly convenient floor height, although higher than rear-engined double deckers. An advantage was that the full length of the lower deck was available for passengers, although axle load limits in some cases meant that it was not possible to obtain the full benefits of this potential capacity. In addition the combination of a low slung engine with low profile tyres reduced the ground clearance, which meant that the model was not suitable for many applications.

20 THE CHASSIS OF A LEYLAND LION UNDERFLOOR-ENGINED DOUBLE DECKER IS SEEN AT THE LEYLAND BUS FARINGTON PLANT (AFTER WHICH ONE VERSION OF THE POSTWAR LEYLAND TITAN BUS BODY WAS NAMED) ON 17 MAY 1986. NOTE HOW THE FRAME SLOPES DOWN TOWARDS THE FRONT TO REDUCE THE STEP HEIGHTS. THE ENGINE IS MIDWAY ALONG THE CHASSIS, WHICH HAS A PERIMETER FRAME TO ASSIST THE MOUNTING OF THE BODY. THE SITE IS NOW A SUPERMARKET CAR PARK! (BASIL HANCOCK)

The first example was built in 1982 and between then and 1993 nearly 600 entered service in the UK, although it only operated in very limited numbers overseas. In addition a few B10M chassis had their coach bodies removed after some years and new double deck bodies fitted.

21 KELVIN SCOTTISH ALEXANDER-BODIED LEYLAND LION R2852 IS SEEN AT A SMALL EXHIBITION AT LEYLAND ON 23 AUGUST 1987. THE USE OF LOW PROFILE TYRES TO REDUCE THE FLOOR HEIGHT IS OBVIOUS, WHILE THE HEIGHT OF THE LOWER DECK WINDOWS IS A RESULT OF THE HIGHER FLOOR LEVEL THAN IN CONTEMPORARY REAR-ENGINED DOUBLE DECKERS. A THREE AXLE ECW-BODIED OLYMPIAN COACH IS BEHIND. (BASIL HANCOCK)

Leyland Bus, not wanting to be left out of any potential swing to underfloor-engined 'deckers developed a similar mid-engined chassis in conjunction with its DAB subsidiary. The resulting vehicle, known as the Lion, had a higher floor than the Citybus but only 32 entered service from 1986 to 1989, 19 with the Scottish Bus Group and 13 with Nottingham City Transport. Volvo's purchase of Leyland Bus in 1988 led to the rapid cancellation of the model, while the subsequent involvement of DAB in United Bus meant that in any case the chassis would not remain available.

In the end the introduction of low floor buses and subsequent legislation requiring disabled access meant that the underfloor-engined double decker was doomed and none have been built in the UK or as far as is known elsewhere either since the early 1990s.

Would the Comeng Bus have Worked?

Basil Hancock provides some thoughts.

The idea was astonishing for its time, not only in terms of its layout, with horizontal engine and front and rear entrances, but because technically it was way ahead of what was generally around in 1947. Outside of the USA only the sole experimental Leyland low floor trolleybus of 1935 had previously been built with a similar layout, but maybe the Sydney double deck AEC Qs, three petrol (later diesel) buses and three trolleybuses which were all still in service in 1947, had got people thinking about alternative layouts.

In 1947 there were very few horizontal engines in existence. Leyland had one which it had used in the pre-war TF for London Transport and in the one and only Panda, but it was far from a production item (they would have produced less than 100 examples and it was in any case based on the obsolete 8.6-litre engine) and the horizontal 600 would not appear until late 1949. BMMO had their 8-litre horizontal K-series, by then in production in the S6, but they only built it for their own use. AEC had produced just one experimental underfloor-engined single decker in 1939 and the horizontal 9.6 litre engine was still two years away in 1947. Gardner, Bristol and Daimler had nothing and would not have until 1950 or later. And Sentinel would not go into production with their horizontal engine until 1949 either.

So where did the idea for a horizontal Meadows engine come from? Henry Meadows was a small engine producer, at least for commercial vehicles, based in Wolverhampton, and their main use in buses at the time would be in Guy Arabs, where the 10.35 litre 6DC-630 was an option (although only taken up by a very few operators, including Midland Red) rated at up to 150 bhp. It was a compact engine but it was not very successful and I believe it was quite thirsty. Meadows did not build a horizontal version at that time. I don't know if Meadows were represented in Australia, but I assume that they must have been and perhaps a few engines may have made their way to Australia in trucks. In addition, I have never heard of a supercharged Meadows engine rated at 170 bhp, especially as early as 1947, but that's not to say it did not exist. However as far as I know the DRTT never used a Meadows engine before or since.

The very first horizontal Meadows engine, as far as I know, was a 4DC-330 which was converted from a vertical engine by Rowe in Cornwall in 1953 for their prototype Hillmaster chassis. Meadows were very sceptical but came to have a look and ultimately developed their own four and six-cylinder horizontals themselves, but only in the mid-1950s. The only one I know of which still exists is a 6HDC-500 in the preserved British Railways track recording railbus.

I am therefore very curious as to how and why a Meadows horizontal engine, which didn't then exist and wouldn't for another seven years at least, was selected, and then supercharged as well just to make it even more of a potential problem. I suspect that Comeng were just as mystified as there are virtually no details of the engine provided - even its capacity or number of cylinders - although the other mechanical units are described in detail. Were they clutching at straws?

Perhaps as an independent Comeng product they did not want to use a diesel engine from any of the mainstream UK bus manufacturers (in those days Australia was tied very firmly to the UK and the large-scale use of engines or chassis from any other country would have been unacceptable). So this really only left Gardner, Meadows and Perkins as potential suppliers. The very traditional Gardner would not then have been interested as they were fully committed and the 6LW in any case it would not have provided anything like enough power (and Gardner would most certainly not have allowed you to supercharge it). They only turned to turbocharging begrudgingly some 40 years later. Perkins would also have been unlikely to have any suitable engine, which left only Meadows.

I note that the packaging of the engine as shown is very tight, so tight in fact that, as drawn, if the engine had rotated on its (presumably flexible) mountings, it would have hit the floor and body side panels! Apart from the fact that in my opinion the clearances are far too tight, as a compact supercharged engine I would think that heat, and the risk of fires, was a real likelihood, especially in Sydney's climate. I am not sure that there was a fluid flywheel and epicyclic transmission in 1947 which could have coped with 170 bhp and the associated torque. Even railcar epicyclic transmissions of the day were usually rated at no more than around 130 bhp.

However, the biggest issue I have with the Comeng bus is that I think it would have exceeded the permissible axle loads and could never have been legally registered. It was longer and quite a bit heavier than a Sydney double decker and had more seats, but I believe that the standard 'deckers were axle load-challenged, so without any dispensation I think that it could never have operated. And if it had been built, were the tyres of 1947 really up to it? In all honesty I think Comeng would have struggled to achieve the stated 9.3 tons unladen weight, and if they had the structure would have probably had to be sufficiently spindly to make the likelihood of major structural failures later in life a real possibility, particularly given the standards of Sydney's roads at the time.

Other potential issues are:

The Centre of Gravity would probably have been a little higher than for a front-engined 'decker, so the risk of overturning would have been greater, and in those days double deck buses overturning seems to have been an issue.

The engine was offset so far to the offside that there would have been uneven tyre loadings on each side, leading to excessive tyre wear and odd handling. This was a real issue in service with the BMMO D10 which also had an offset engine, but in this case to the nearside.

The angle of the propshaft relative to the engine, gearbox and rear axle is quite large and could be expected to have caused considerable problems with the universal joints in service. BMMO solved a similar problem on the D10 by placing a transfer box behind the gearbox to bring the driveline closer to the vehicle centre line.

The use of an automatic transmission control, particularly for an epicyclic gearbox, was virtually unheard of at the time and I wonder how well it would have worked. In 1947 pneumocyclic or mono-control semi-automatics were still around six years in the future and it wasn't until the Routemaster entered general service in 1958 that automatic transmissions really became acceptable. Would it really have worked reliably?

Manual steering would have been very heavy, but the use of air-assisted power steering is a novel idea which I don't think was ever used in practice. Unless there was some priority given to the required air supply, you can just imagine the power steering dying out during heavy braking. BMMO D9s reportedly had similar issues with their hydraulic power steering.

A lot of details are missing, such as fuel tank, air reservoirs, batteries, etc, but this is probably not surprising considering the conceptual layout of this vehicle.

I think it was a fantastic concept and way ahead of its time and Comeng deserve full credit for the idea, but I cannot see that it would ever have been a success. The Meadows engine alone would have seen it off. It might have worked as a trolleybus, but as a double-deck diesel bus in 1947 I think that it was a brave but misguided idea.

Just to put it into context, the first production Leyland Titan PD2 only went into service in July 1947, a month **after** this design appeared, AEC were still in the process of transitioning from the post-war Regent III RT to the Provincial Regent III, and the very first postwar RT had only entered service in London the previous month. London Transport was still a little while from commencing the thinking which led to the Routemaster, AEC and Leyland were still a long way from the Regent IV and Lowloader concepts and underfloor-engined single deckers were still a novelty, only in service in large numbers with one operator. The manufacturing industry had enough problems due to its inability to produce enough new buses to meet the demand without going down risky, untried and potentially expensive new paths.

As a final point, the DD/71 drawings and model have a radiator grille very similar to the AEC Regent V and various other truck and bus models. If Comeng had registered the design they could perhaps have sued AEC for infringement of copyright. However, that's probably the only money they would ever have made from the project!

But what a great shame that no Comeng underfloor-engined 'decker was ever built.

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