DAWN OF THE NEW ENERGY ERA

To: Energy Researchers, Government, Industry and the Media Dated: March 1st.2016

The attached document, although brief, provides a coherent and detailed account of the Direct Electric Energy Cell and its transforming effect on power generation and global transportation systems [in concert with the emerging and remarkable Supercapacitor technology].

It illustrates how the polluting emissions of the combustion era can, almost over night, be reduced to practically ZERO, by retrofit projects on our fleets of road and rail vehicles, our fleets of commercial, military and private aircraft and finally on our fleets of commercial, naval and private marine craft.

In the course of the implementation of these vast, national and international projects, the industrial activity throughout the globe will explode creating many millions of quality long-term jobs in an environment of purpose and growing confidence in our collective future.

John Varney

THE CANADIAN ENERGY INITIATIVE - LETS START NOW

[for power generation and all forms of transportation via special high performance super-capacitors]

Note: This brief and condensed document introduces the exciting prospect of a powerful, clean and extremely low cost emerging energy source, initially with a summary of the primary components in the proposed concept, followed by more specifics of the important applications to transportation systems for aircraft and marine craft. The road and rail transportation systems do not need further clarity and the spacecraft applications will be explored at a later date [not being crucial to meeting the climate change challenge].

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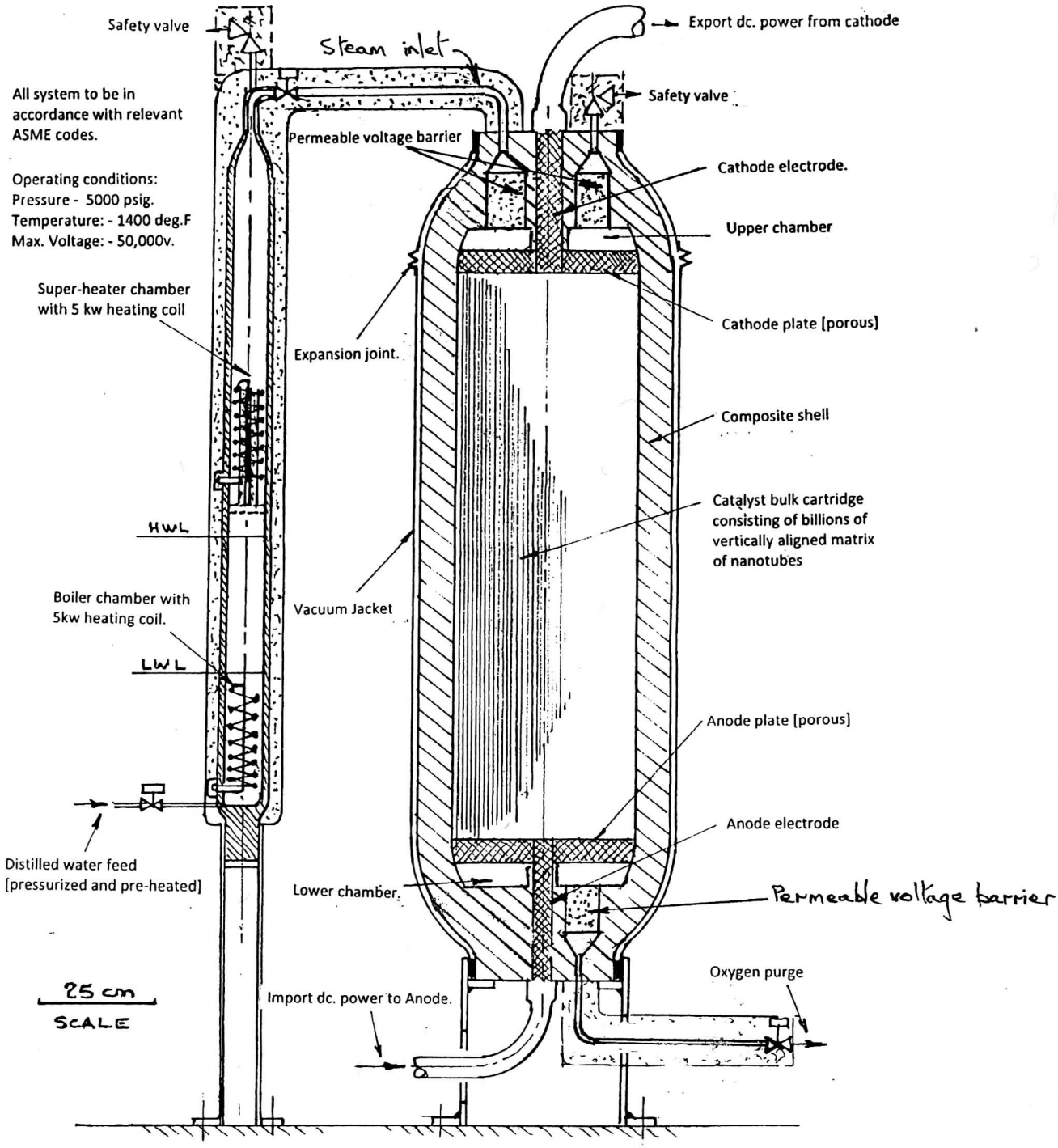
When government, industry and the public establish the cohesion required to bring in the new era of energy, the global energy sources will emerge as follows:

Renewables -

Primarily via wind farms and solar farms [augmented with banks of powerful energy storage devices known as super-capacitors] so that on days with abundant wind or sun any surplus energy can be stored in the super-capacitors. On days with no wind or sun then these powerful storage devices would store and subsequently export dc. power at 50,000v [for maximum energy density] via processing to ac. at the appropriate voltage to the local grid.

The balance from Pressurized Direct Electric Energy Cells - These simple, safe, clean energy devices [although, as yet proving and testing on this device, around the globe, has not been revealed] would, when mass produced, be robust, reliable and compact with extremely low capital, installation and operating costs and could be supplied in the standard sizes 10MW, 25MW, 50MW, 100MW and 200MW. The Device produces direct electrical dc. power from LENR fusion processes under extreme press/temp conditions via a nanotube cartridge that forms the reactive part of the cell. Each unit would have a broad, smooth operating range [say from 100% output down to 2% output]. The global transportation networks: Utilizing the Barium Titanate solid state super-capacitor units, exporting dc. energy at 5000v or at 50,000v. or for space propulsion [using anti-gravity technology] at a remarkable 500,000v. The super-capacitor exporting dc. energy at 5000v. - storage energy density 5 KWH/Liter or 142KWH/ cu.ft. Super-capacitor weight is 110lbs/cu.ft. Note: dc.output processed as required to deliver power to dc. or ac. motor drives to following vehicle groups:- Road vehicles and passenger or freight trains running on non-electric rail networks. Small aircraft [under 100,000 lbs. TO weight] - 2 stage axial fan directly coupled to dc. or ac drive motor [housed in nacelles]. Small marine craft [under 500 gross tons] - vessel"s propellers or water-jets connected directly or via gearbox to dc. or ac. drive motors. The super-capacitor exporting dc. energy at 50,000v - storage energy density 50 KWH/liter or 1420 KWH/cu.ft. Super-capacitor weight is 110lbs/cu.ft. The dc. output processed as required to deliver power to dc. or ac. motor drives to following vehicle groups:- Large aircraft [all categories over 100,000 lbs TO weight] with extreme range. - 2 stage axial fan directly coupled to dc. or ac. drive motor [housed in nacelles]. Ocean going shipping [all categories over 500 gross tons] - vessels propellers or water-jets connected directly or via gearbox to dc. or ac. drive motors. The larger ocean going vessels including Naval vessels [both surface and submarine] and cruise liners will also include [as a means of continuously charging the large banks of super-capacitors] a single "pressurized direct electric energy cell [of an appropriate standard size] that at maximum output, would meet the average power demand rate of the ship during an ocean crossing. This average rate of power would represent perhaps less than 25% of the maximum power demands [propulsion plus ship's services]. For this new era of energy, charging stations on all highways [and in all neighbourhoods], rail terminals, airports and seaports would be required, offering 5000v dc energy to the vehicle super-capacitor units. Further charging stations will be required at airports and seaports. offering 50,000v dc. energy to the vehicle super-capacitor units. The super-capacitor exporting dc. energy at 500,000v - storage energy density 500 KWH/liter or 14200 KWH/cu.ft. The super-capacitor weight is 110 lbs/cu.ft.. These units would directly supply dc. power to an array of electrohydrodynamic thruster units in the space craft, to effect an anti-gravity propulsion system. The space craft would utilize a bank of pressurized direct electric energy cells to continuously charge the banks of super-capacitors and these cells would only represent about 25% of the maximum power rating for the space craft. The necessity and relevance of fossil fueled power generation or vehicle fossil propulsion or indeed of fissile fueled nuclear power plant or vehicle nuclear propulsion, will be totally redundant in this new and exciting energy era.

John Varney



The Direct Electric Energy Cell and Boiler/Superheater system

The role of the miniature electric boiler/superheater system [rated at 10 KW] is to provide the means of pressurizing the energy cell to the initial conditions of 3500 p.s.i.g at 1400 deg.F, via entry to the upper head of the energy cell and then subsequently to supply a micro feed of superheated steam to the upper head to maintain full target conditions during operation of the energy cell at power [say from 2% max. power thru to 100% max power]. The oxygen micro bleed [resulting from ongoing low level electrolysis] from a controlled micro vent in the lower head, will ensure that all oxygen is immediately removed from the system and safely vented to atmosphere via a line made of materials that are inert to oxygen.

A boiler/superheater system will be dedicated to each energy cell so that each energy cell in a battery of cells in a power station, may be operated independently at any load [between 2% capacity to 100% capacity]. The size of energy cell recommended for testing and proving is the EC40 which has a catalyst cartridge diameter of 40 cm. and

a cartridge height of 120 cm.. The performance of the EC40 energy cell will be determined during proving and testing at a max. operating voltage of 50,000v

Pressurization and Commissioning

Pressurization:

Although the catalyst cartridge [the catalyst bulk] has the requirements of being highly conductive [electrically], structurally sound at target conditions, is not brittle [subject to shattering], holds an array of billions of vertically aligned regularly spaced nanotubes [connecting the anode and cathode electrode plates] and is porous to high temperature steam [also to hydrogen and oxygen resulting from the electrolysis process], it may be less porous to steam during the initial pressurization process and it may be necessary to permit appreciable pressure differential across the catalyst cartridge to allow steam to migrate from the upper head entry point to the lower head during purge and pressurization to initially 3500 p.s.i.g. and 1400 deg.F. The pressurization process admits the superheated steam to the upper head and initially purges air from the lower head before closing the purge valve and continuing to the pressure of 3500 p.s.i.g. when the steam inlet to upper head is isolated and the energy cell is thus ready for final pressurization to the target conditions of 5000 p.s.i.g. and 1400 deg.F via the electrolysis phase.

Commissioning:

The following is a description of the critical part of the direct electric energy cell operating process for your clarification.
The electrolysis phase in converting the extreme high press/temp steam [thru dissociation] into hydrogen and oxygen within the special environment of the cartridge of the catalyst bulk [a nest of packed vertically aligned nanotubes] packs the cell with hydrogen to the full target conditions as the heavier oxygen sinks to the lower head via the porous anode plate and is bled away.

Whilst this electrolysis progresses, driven by power delivered to the anode plate, a pure hydrogen bubble builds in the cell that eventually fills the complete cartridge space [oxygen going to lower head] and approaches the target conditions.

Although the power required at the anode gradually decreases [voltage constant with reducing amps] the intimacy of the hydrogen atoms in each of the billions of vertically aligned nanotubes causes the fusion of some of adjacent atoms [forming the hydrogen isotope of deuterium] such that the stripped electrons go to the anode plate and the deuterium ion goes to the cathode plate establishing a tiny electric current [under the continuing imported power voltage potential].

Further fusion reactions occur in the nanotubes [namely tritium - from deuterium + hydrogen and helium - from tritium + hydrogen and finally helium - from deuterium + deuterium. These isotopes again have electrons stripped [going to anode] and ions go to the cathode.

The net result is that as electrolysis proceeds to completion, the amperage established by the fusion reactions continuously increases to its maximum with the full voltage of the anode power input remaining but only a tiny remnant of the associated amperage with that power input remaining.

We now have a stable low power **output** from the cathode of the energy cell that consists of the full [maximum] amperage [derived from the fusion reactions] and the residual voltage from the power input at the anode.

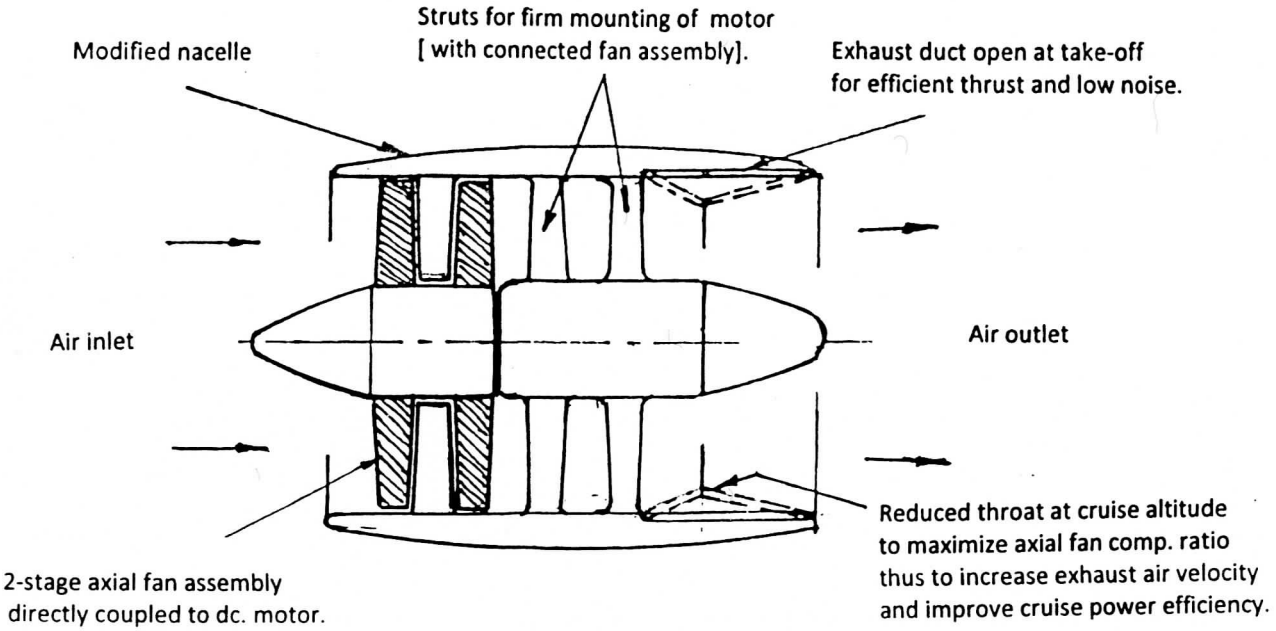
Once this condition is fully stabilized we may then gradually increase the voltage applied to the anode [the amperage component being almost zero] and now calling it the driving voltage, the output of the cell is the stable maximum fusion reactions amperage multiplied by the driving voltage [worn like a jacket] appearing at the cathode.

The voltage can then be increased [at the anode input] to the target maximum of 50,000v to generate the maximum cell output. As time goes by the consumption of hydrogen will cause the cell pressure to decline and a regular tiny injection of steam to the upper head will result in a small amount of electrolysis [on the fly] that will replenish the hydrogen compliment whilst bleeding the oxygen produced from the lower head and maintaining the energy cell at full output.

With this cell we can operate smoothly between say 2% full load and 100% full load merely by adjusting the voltage at the anode input.

John Varney

ELECTRIC AIRCRAFT



THE ELECTRIC MOTOR DRIVEN JET

PURPOSE: To eliminate emissions from existing fleets of commercial, private and military aircraft by the retrofit with motor driven 2 stage axial fans, thus replacing the combustion based jet engines [sub sonic only at this time]. Further to introduce new aircraft, custom designed for electric propulsion and thus totally eliminate atmospheric pollution from aircraft.

Various operations would be involved in the retrofit process that would involve existing fuel tank removal from the fuselage [plus clean-up]. purge and clean out wing fuel tanks[and seal-up],and then modify existing nacelles to accommodate the new electric units.

Adequate sized supercapacitors would be installed in the fuselage [the equivalent of new fuel tanks] and then all necessary cabling and controls integrated into the aircraft as a thoroughly pre-engineered retrofit operation. The discharge terminal on each supercapacitor unit would incorporate a voltage processor to deliver the desired dc. voltage to the propulsion motors. Branched from that line would be further processing to deliver ac. supply power at a suitable voltage for all other aircraft systems and services.

Rules of thumb for sizing the supercapacitors: For aircraft less than 100,000 lbs. take-off wt., the stored energy [at 5000v] would be sufficient to power all of the aircraft power demands [at cruise condition] for say 10 hours and this would incorporate a safety margin and peak power during take-off, climb and landing, thus giving a practical range of say 3,500 miles.

For aircraft of more than 100,000 lbs. wt, the stored energy [at 50,000v] would be sufficient to power all aircraft demands for say 20 hours at cruise condition again allowing for a margin of safety and peak power demands, thus giving a range of about 9,000 miles.

ELECTRIC MARINECRAFT

Purpose: To eliminate emissions from existing marinecraft engines [in commercial, naval and private categories] by retrofit of electric motor drives for vessel propulsion system together with banks of supercapacitors [located at any suitable available space on vessel [not in existing engine room if no space available]. This will make the existing combustion engine power train redundant but for practical purposes left in place. Further, to eventually build new vessels that are custom designed for electric propulsion and are thus far simpler and smaller than the vessels that were of the previous era.

The retrofit drive train [electric motor, gearbox and propeller] would of course be in the required location whilst the banks of supercapacitors wold be located where space is available. The dc.outputs of the supercapacitors would be processed to provide the required blend of ac./dc. users at the required voltages.

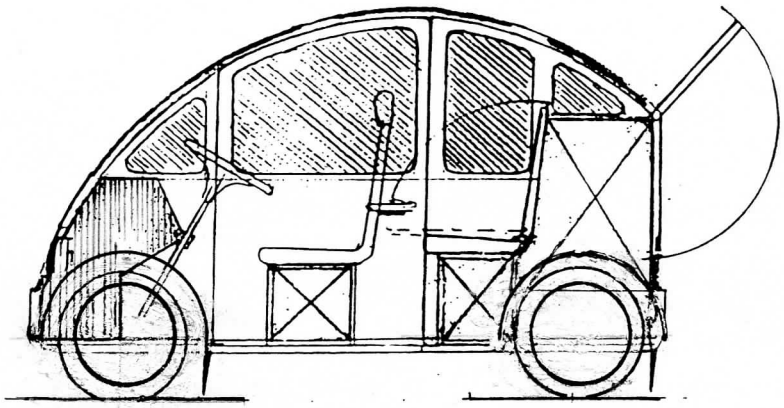
Rules of thumb for sizing banks of supercapacitors: For vessels under 500 tons and using 5000v units, the stored energy [total] required would be sufficient to meet all normal power demands for say a 7 day off-shore voyage.

For vessels over 500 tons and using 50,000v supercapacitors, the total stored energy would be sufficient to meet all normal power demands for say a 10 day ocean crossing

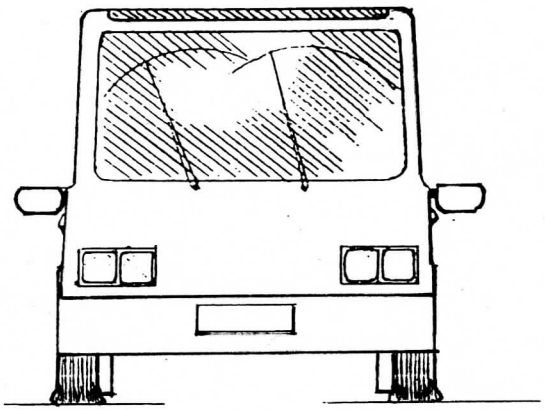
For naval vessels [surface or submarine] that may require extended periods at sea or for cruise ships, a single pressurized direct electric energy cell that represents a max. power output of at least 25% of ships maximum power demand, will serve to continuously replenish the charge of the bank of supercapacitors.

The main feature of this concept vehicle is the powerful 300KWH Solid State Supercapacitor [located securely and safely under the rear bench seat] and incorporating a modified barium titanate treatment of the extensive surfaces of tightly packed plates. The unit would be encapsulated with a generous layer of efficient, robust and flexible [non cracking] insulating material that would easily confine the operating voltage [charge/discharge] of approx. 5000v dc. A further skin of high strength composite material would be provided to prevent rupture in the event of a serious crash event. Adjacent to the discharge terminal will be a voltage processor that will reduce the output to say 500v for supply to the dc. drive motors [one on each rear wheel]. Further processing on a branch of the the 500v system will provide ac. at a suitable voltage for all other vehicle systems and services.
The HVAC system is located under the front twin seats, whilst the power steering, power brakes and windscreen wiper systems are housed beneath the dashboard consul in separate compartments.
Of course all state of the art suspension, air -bag, electric window and electronic communication facilities would be provided according to price range of targeted customers.

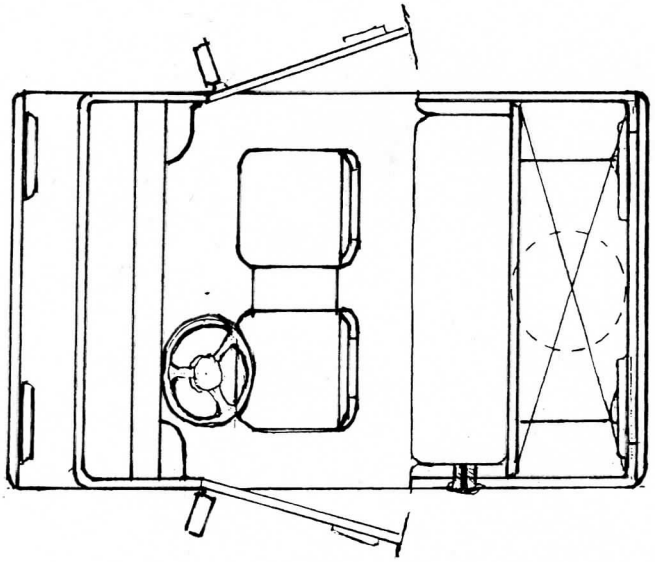
Vehicle data: Length 120 inches: Width 72 inches: Height 72 inches: Wheels 26 inch dia.:
Trunk space 25 cu.ft.: Range approx. 600 miles



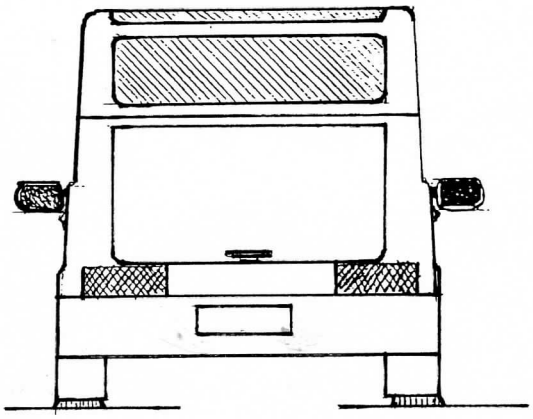
SECTIONAL SIDE VIEW



FRONT VIEW



SECTIONAL PLAN



REAR VIEW