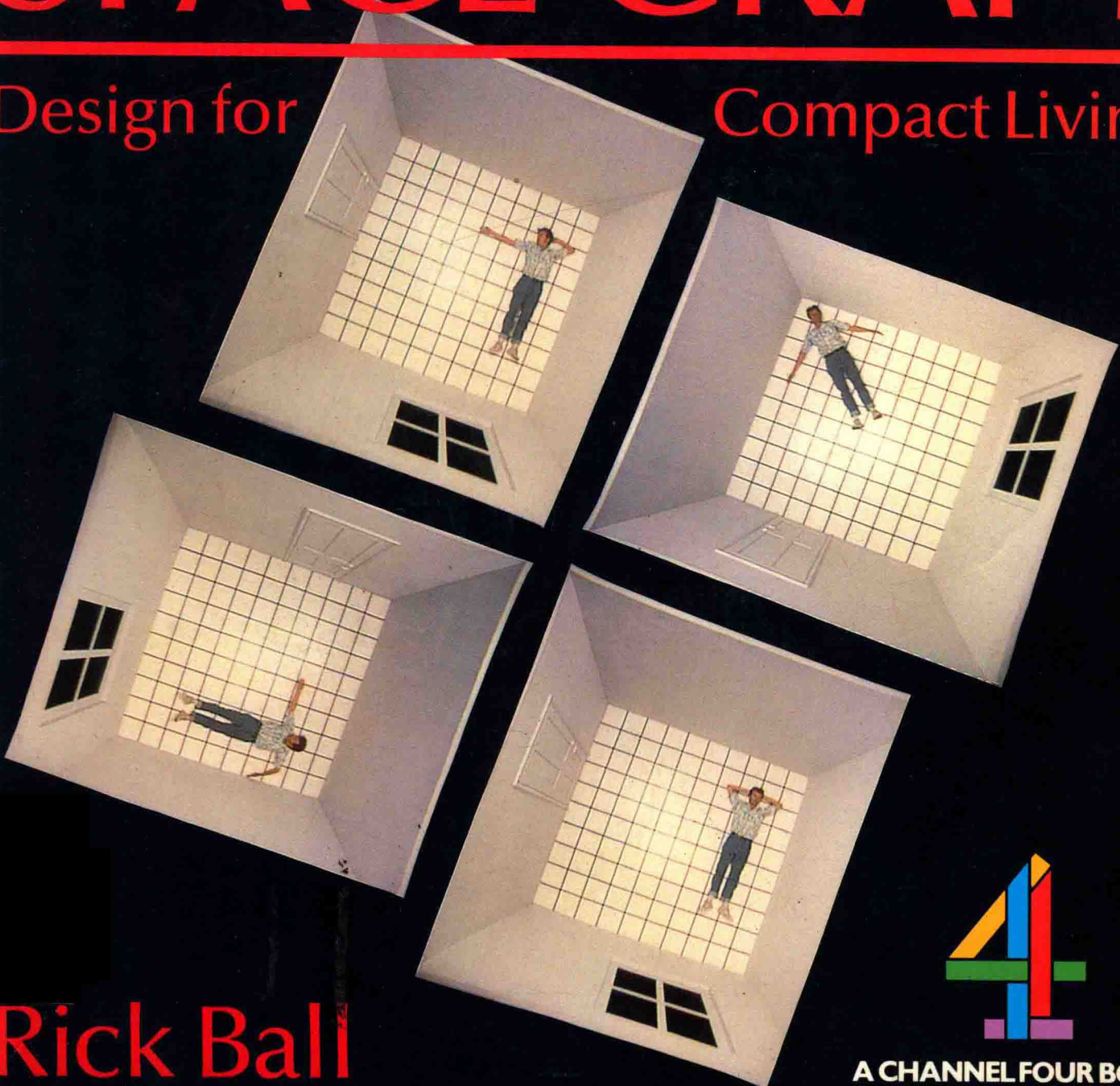


# SPACE CRAFT

Design for

Compact Living

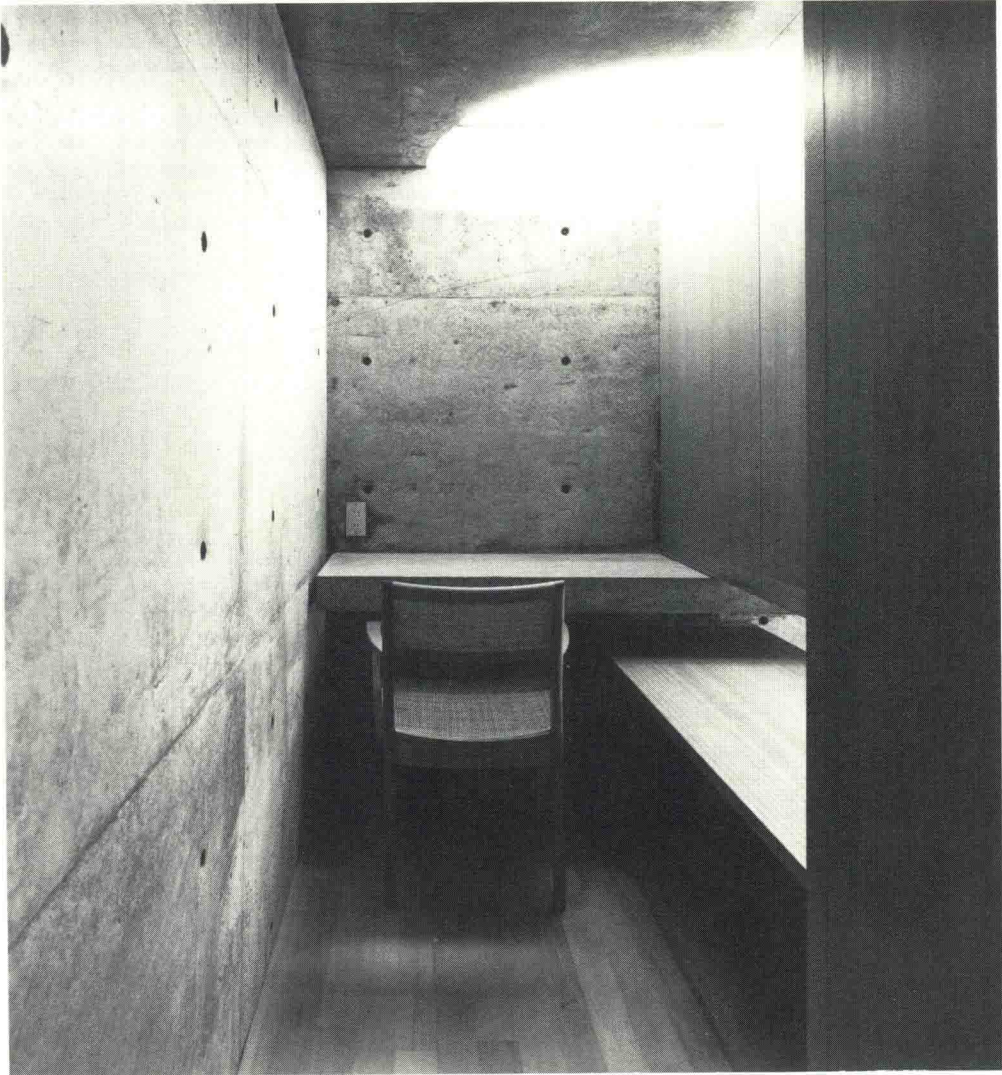


Rick Ball



A CHANNEL FOUR BOOK

# SPACE CRAFT



Design for Compact Living

The illustrations on the title pages show two extremes – the minimalist and the gadget-minded – of small-space planning. The engraving on the left is of a design made in the late 1600s by Cornelius Meyer, who took time off from hydraulic engineering to plan a one-room apartment. It looks forward to most of the solutions of this century: folding furniture, built-in storage, and so on. Other features – the large number of safes and strong-boxes, a camera obscura to watch what was going on in the street, and listening tubes that allow the owner to listen in on conversations in other rooms – suggest paranoia. Another view of the room is shown on page 31. The Meyer tradition of ingenious solutions is carried on by campers (see page 119), barge builders (page 32) and space travellers (page 37).

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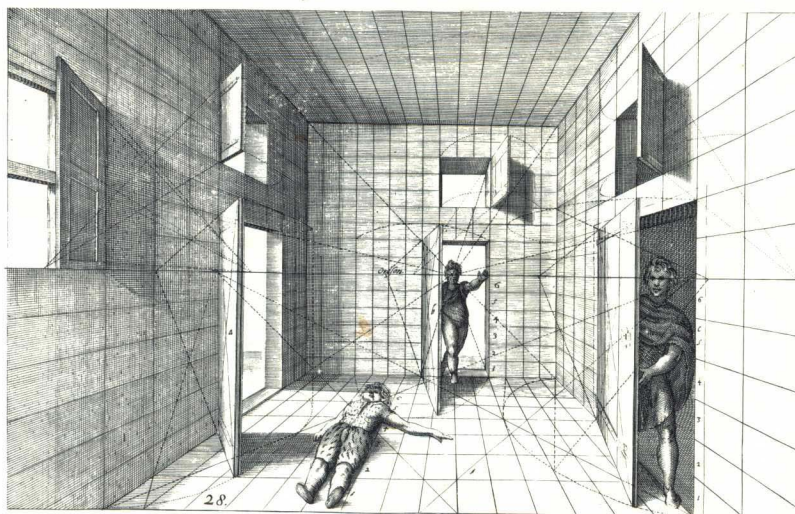


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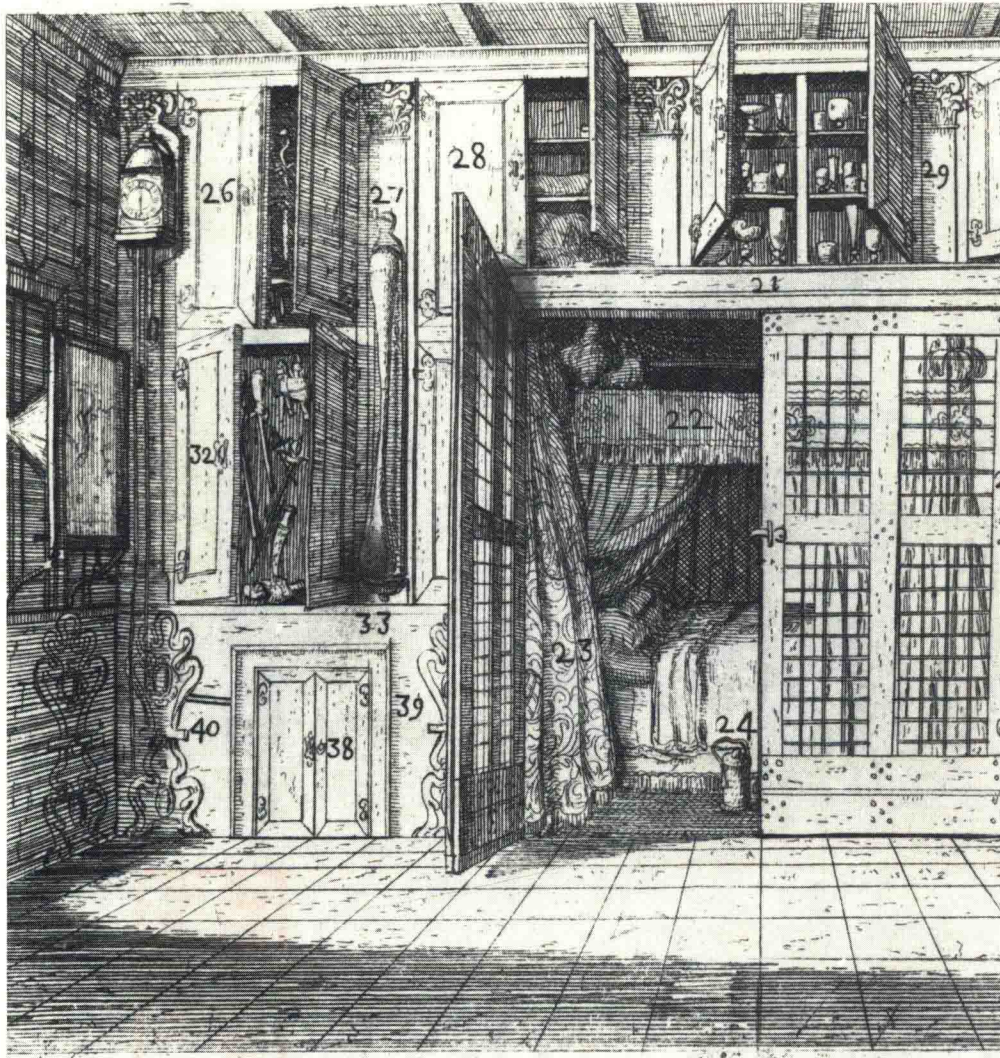
## SPACE CRAFT

宇宙空间



Design for Compact Living

# RICK BALL

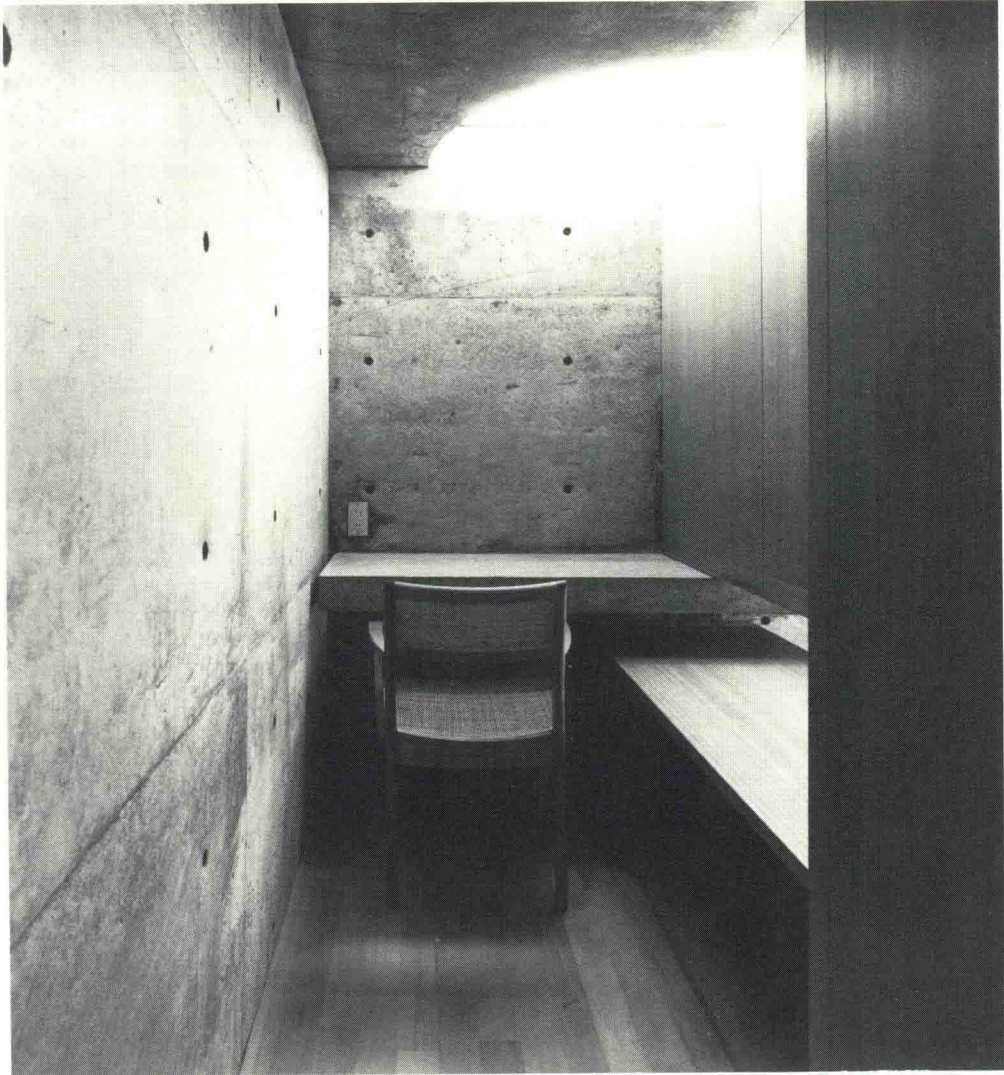


George Philip

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# SPACE CRAFT



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## SPACE CRAFT

Living spaces are shrinking, as prices and populations rise. The special problems and opportunities of life in a small space affect an ever-growing number of people – the couple setting up together for the first time on a limited budget and in an expensive city, the old person leaving the large old family house to move into a small retirement home or to share a son's or daughter's house, the working man or woman who needs to fit a darkroom or an office into a packed apartment, single people preferring a small city-centre apartment to a large one in the suburbs, or the growing family who must pack more people into the same number of rooms.

*Space Craft* is a manual of practical design ideas to make living in small spaces less awkward, whether the problem is lack of privacy, an inadequate kitchen or bathroom, or the eternal shortage of storage space.

The problem is basically one of interior design, and the work of some of the world's most interesting specialist professional designers is analysed and illustrated in the following pages. However, the research for this book has proved to us that you don't have to be a professional interior designer to design your interior successfully. We are surrounded by design ideas, and ideas are free.

Experience has led vast numbers

of non-professionals to inventive low-cost solutions to the problems of life in a tiny home. Careful planning helps them live the cramped life without learning to loathe either their homes or the people they live with. Many of the most interesting ideas come from people living on the move, in conditions where space economy is crucial. The layout of space and the design of fittings in canal boats, aircraft, submarines, caravans, tents, space shuttles, even prisons, not only illustrate the needs and problems of occupants of a confined space but also provide a large number of ideas adaptable for use at home.

Some non-nomadic cultures are





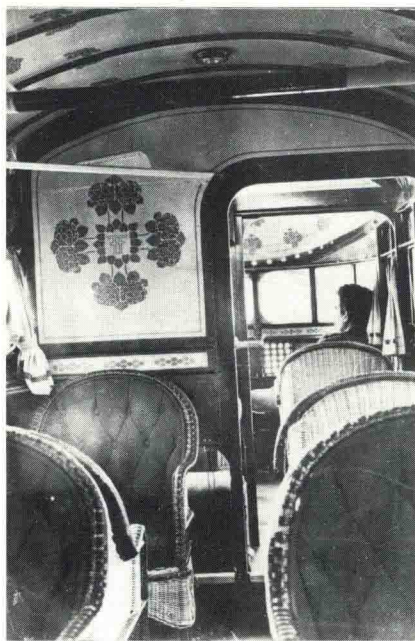
## SPACE CRAFT

adept at adapting the tiniest of spaces to elegant living. The traditional Japanese interior is a clear and useful example, where the spaces are flexible, the furniture low and the number of possessions limited.

Even the Japanese tea master might be in awe of St Simeon the Stylite, who could dispute with Diogenes in his barrel the claim to be the patron of people living in small spaces. St Simeon found life in fifth-century Syrian hermitages and monasteries too opulent, and he therefore became the first of the great 'pillar ascetics'. In 423 he moved to a pillar and stayed there for over thirty years, living on a 12ft (3.6m) square platform 60ft (18m) from the ground. He became quite a tourist attraction at the time and inspired a curious fashion for platform living.

Our only tribute to the admirable St Simeon is the platform bed, which is one of the many space-saving ideas examined in *Space Craft* as part of our step-by-step invasion of a small space. The book contains practical information to help you make a thorough structural survey of your living space, and there are detailed instructions on producing simple but adequate working drawings or models. These are useful tools when you begin to plan the best use of the space.

Beyond the building stage, we look at the exploitation of decorative devices to make your small space seem bigger than it is. The choice of suitable furniture and appliances will also have an impact on the efficient use of space. Some of the best miniature equipment from manufacturers and designers around



*The flat on the left is a one-room living and working space in London. It contains a built-in bed and shelving, classic modern and antique furniture, paintings, books and the tools of bookbinding, scholarship and cooking (see page 91). It is home for three people, who prove that living in a small space does not exclude possessions and pastimes. On the other hand it does mean that furnishings and floor coverings – which are used heavily – must be chosen with care. An elegant solution may not be tough enough, a sad fact proved by the cabin designed in 1935 for Air France by the architect Mallet-Stevens (above). The passengers sat on wicker chairs – elegant, light and resilient enough to be useful in small domestic spaces, airships and ocean liners. They did not, alas, stand up to the acceleration and constant vibration of the aircraft. The seating, lighting and storage systems on today's aircraft can provide ideas relevant to small-space living.*

the world is illustrated, along with some of the most absurd.

We are not claiming that small is beautiful in the housing field. It can be very depressing. Yet there are real advantages to small-space living. Small rooms are normally easier and cheaper to heat than large ones; there is less to clean and maintain, and you can save money by being unable to buy more appliances simply because there is no room for them. There is also a certain attraction in the miniature, from dolls' houses, ships in bottles and bonsai trees to toy poodles and the Sony Walkman.

Probably the most important lesson to be learned from the travellers and professional designers is to be aware of yourself and the way you live. The most underused small space of all, we are often told, is the human brain. It can be interesting and profitable to fire up a few brain cells on your design problem, and no one stands more chance of getting it right than you do. The whole point of designing and decorating your own space is to end up with a result that works for you and that you like living with. It doesn't matter if your ideas would not be awarded the design professionals' seal of approval: they do not have to live there.

The ideas in *Space Craft* are particularly relevant to people in compact spaces, both those who own their own place and those trying to make the best of a rented apartment filled with the landlord's random selection of junk furniture. Many of the ideas will be useful even if you live in a vast hangar – we all want more room, and *Space Craft* will help you find it.



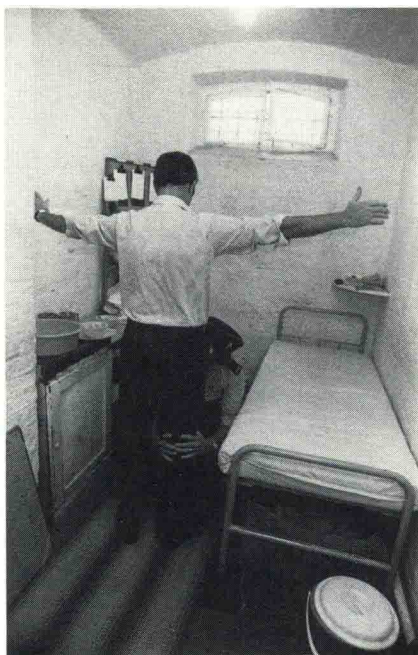
## LIVING UNDER PRESSURE

Looking at people forced to live in extremely cramped conditions, where privacy is minimal, can provide both warnings and lessons for anyone planning a small living space, particularly if that space must be shared with others. In Britain's overcrowded prisons, which house the highest number of prisoners per head of population in western Europe, serious unrest has been depressingly common. Many who work in the system are convinced that overcrowding is partly to blame.

Although long-term prisoners will probably have a cell to themselves, which they can decorate to their taste, short-term prisoners and those awaiting trial could be forced to share their cell with two others. In such conditions a pair of bunks along one long wall would face a single bed opposite. For twenty-three hours a day the three men could be locked up with no privacy except inside the earplug of a personal radio. Significantly, the personal stereo cassette player has become an almost essential part of the modern submariner's kit, a simple way of shutting out the rest of the world.

Some find the lack of privacy intolerable, although prisoners from overcrowded home backgrounds predictably find it less stressful. Perhaps the most onerous element in the lack of privacy is the bucket in the cell corner, a wc which the three men must share from about 4.30 in the afternoon until the cell is opened at 7.30 the following morning.

The only ventilation is through a small window in the outside wall. A



*There is just enough room to stretch your arms for a body search in Her Majesty's prison (above), a luxury the submariner (below) must do without as he tries to clean himself in the 'O' Class diesel-electric boat's cramped shower.*

*The Boeing 747 seating plan (above, right) and the engraving (below, right) used by William Wilberforce in his anti-slavery campaign show how little the geometry of transatlantic travel has changed.*



night in a prison cell would convince anyone of the need for adequate ventilation and opening windows in the smallest of spaces.

Many prisoners deal with the overcrowding by complete withdrawal into themselves, lying on their beds all day without communicating. Rehabilitation workers have found that such people find it hard to wake up once the prison nightmare is over and cannot readjust to life outside.

Each prisoner has a small cupboard for possessions — a few letters, perhaps a change of clothes, a towel, a toothbrush, a plastic knife and fork, metal plates and maybe half a dozen books. There is also a single table and chair which one prisoner may use at breakfast time and all may use to write letters. Pictures can be displayed on the pinboard on the wall.

In certain respects life on a submarine is similar to being in a short-term prison. On a diesel-electric boat the submariner is enclosed with some seventy others for weeks on end. A nuclear submarine will simply stay submerged until the food runs out. As in the prison, privacy is minimal. All the living and working spaces in the boat are linked by a single narrow corridor, in which two people cannot pass with ease. Three tiers of bunks are ranged along one side of the corridor, where the ratings sleep as submarine life passes by. They can at least draw curtains across their bunk for an illusion of privacy.

In the officers' wardroom conditions are slightly better but still

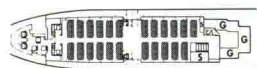
## LIVING UNDER PRESSURE

very cramped, with eight officers sharing a small room which serves as living-room, office and bedroom. Not surprisingly, caravan designers have been called in to make maximum use of the minimal space. Submariners often complain that the people who design their living spaces rarely have to go to sea in them. Only by living in a space can you decide what is really necessary and genuinely convenient. Not all folding furniture works well, for example. When the boat goes in for a refit, the wardroom makes practical suggestions for improvements, and these are routinely incorporated in the design.

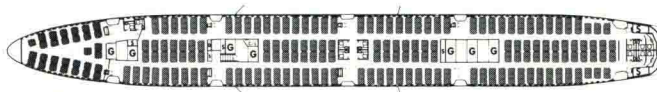
The overcrowding makes for inefficient work. A day's paperwork in the submarine could be finished in a morning in a civilian office. The office desk is also the dining table, with two of the beds serving as seats, supplemented by locker seats similar to piano stools for file stores.

Storage space is everywhere — in the beds, under the mattresses, behind the lights and behind panels in the ceiling and walls. The furniture, from drop-down beds to the refrigerator, is all built in, as are the all-important television monitor, VCR and a cassette tape player. Car cassette players have been used successfully in submarines, as they are small, robust and designed for easy fitting. Cassette tapes tend to wander around the boat, as most people own and use a personal stereo set, but the tapes always come back to their owner. The crowded conditions lead to a sense of community — 'family' is a common description of the atmosphere.

280-in. Upper Deck Extension



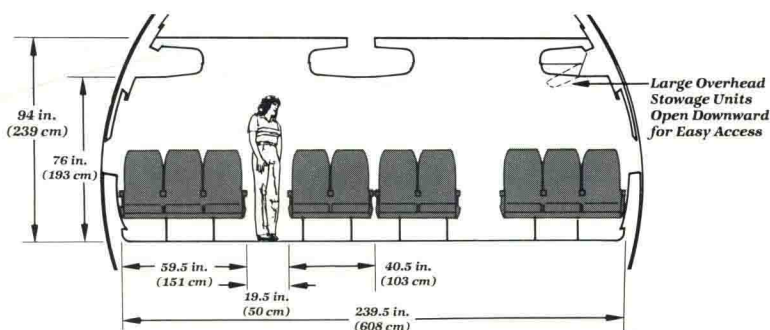
69 Economy



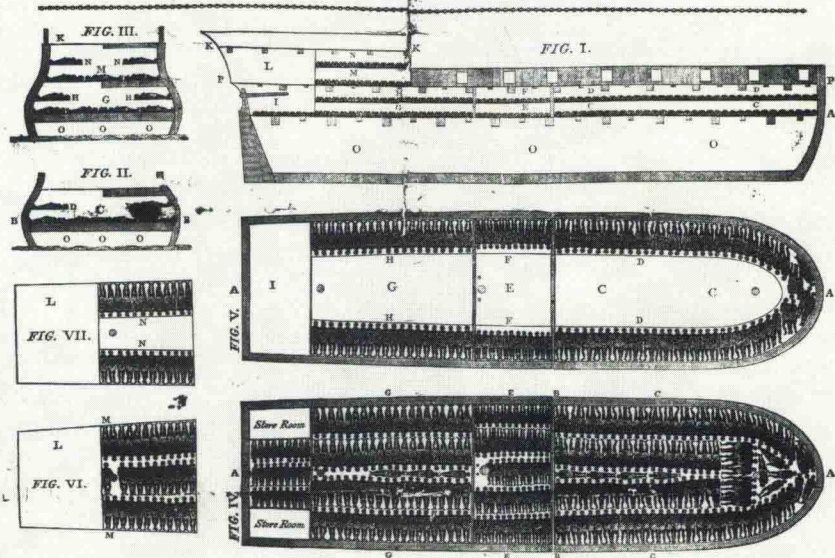
30 First Class

397 Economy

496 Passengers



## DESCRIPTION OF A SLAVE SHIP.





## HOW SMALL IS TOO SMALL?

Overcrowding is a bad thing; everyone agrees about that. Yet the word remains extremely hard to define. Nevertheless, the law regularly attempts to pin the concept down in square feet or metres. The European Economic Community has even laid down rules for the community's battery hens, who must now be given a minimum living space about the size of an A4 sheet of paper. This seems ungenerous. Space allowances for dogs under Britain's Boarding Establishments Act 1963 are more in keeping with a nation supposedly of animal lovers. The kennelled dog must by law be given a floor area of at least 1.1sq. m (12sq. ft); there should be room for a sleeping bench and space for the animal to turn in comfort.

Laws also cover people in spaces. Each British office worker, for

example, should have at least 40sq. ft (3.7sq. m) of floor space and 400 cu. ft (11cu. m) of air to breathe in. Below these limits, the workers are officially overcrowded. Laws governing the living quarters on a traditional narrow boat on Britain's canals are less generous — the Public Health Act demands a minimum of only 90cu. ft (2.55cu. m) of space per person.

A recent definition of overcrowding at home in Britain was given in the Housing Act of 1985. To some extent this Act appears to consider overcrowding to be a moral issue, since there is great concern about sexual overcrowding. This is said to occur when two people of opposite sexes, over ten years old and not living together as a couple, are forced by a lack of space to sleep together in the same room. Small-space designers should bear this in

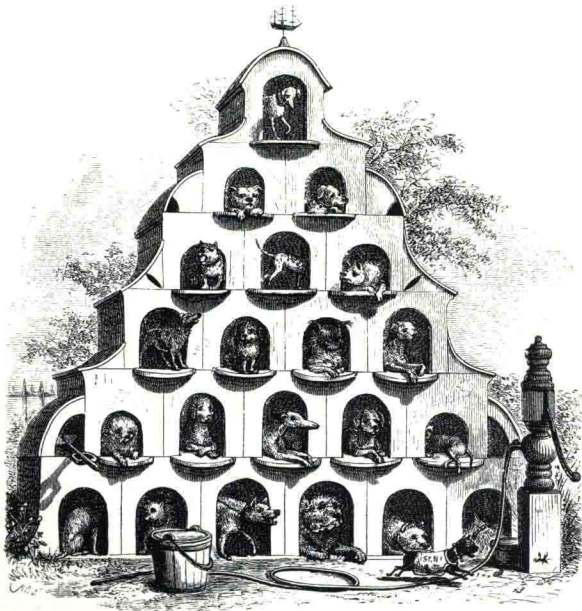
mind. Privacy matters.

The 1985 Act also gives a 'permitted number' of residents for a dwelling of a given size. The number varies — logically enough — with the number and size of rooms. With less obvious logic, kitchens, bathrooms and lavatories do not count as rooms, and children under one year old do not count as people. Those under ten years old are considered half human.

### *Dwelling size Permitted number of people*

1 room (50-70sq. ft)	0.5
1 room (70-90sq. ft)	1
1 room (90-110sq. ft)	1.5
1 room (over 110sq. ft)	2
2 rooms (over 110sq. ft)	3
3 rooms (over 110sq. ft)	5
4 rooms (over 110sq. ft)	7.5
5 rooms (over 110sq. ft)	10

The Housing Act 1985 also lays down some interesting minimum standards for houses shared by



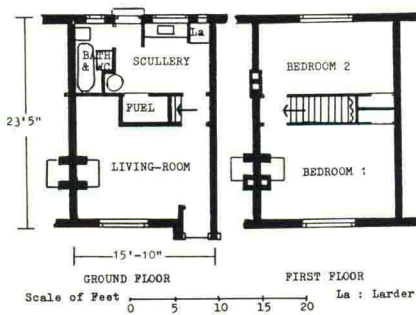
*The multi-storey kennel (left) designed by Walter Ford in 1874 relies on an unusually tolerant collection of dogs, yet it seems less of a fantasy than the famous Japanese capsule hotel (right). If you are willing to bed down in cubicle 4069 the space you save in overcrowded Japan saves you money. It is cheaper than a normal hotel room, cheaper even than the late-night taxi to the suburbs, though the massed smells and snores of an entire cell block can spoil your sleep, in spite of the air conditioning — there is, of course, television to entertain you. Privacy is minimal, and in the morning you will have to share a washroom with many of your fellow guests. It probably works better in Japan, which has a long tradition of public bathing, than it would in the west.*







## HOW SMALL IS TOO SMALL?



*Despite the slogan 'homes fit for heroes', post-1918 housing authorities still wanted more units for less money, as this 1922 plan (above) shows. The rooms are tiny, but the big differences between this plan and bottom-of-the-market housing in the 1980s (the replacement of larder and fuel store by fridge and radiators for example) are in services rather than the gross amount of space allowed. Hellman's protest (right) at the way neat diagrams can be used to hide intolerable conditions appeared in the Architect's Journal. The style he is parodying can be checked out on pages 99 and 107.*

several independent occupants. These can be useful guidelines for anyone planning to divide up a small space. A bedsit, for example, should be at least 140sq. ft (13sq. m) in floor area if it contains its own kitchen facilities, only 110sq. ft (10.2sq. m) if the kitchen is somewhere else in the house. Any bedsit is considered unsuitable for two or more people. Where a flat has at least two rooms, the kitchen must be over 50sq. ft (4.65sq. m) in floor area if only one person is using it, while a kitchen/diner should be 120sq. ft (11.15sq. m) minimum. Bedrooms need be no more than 70sq. ft (6.5sq. m), and living-

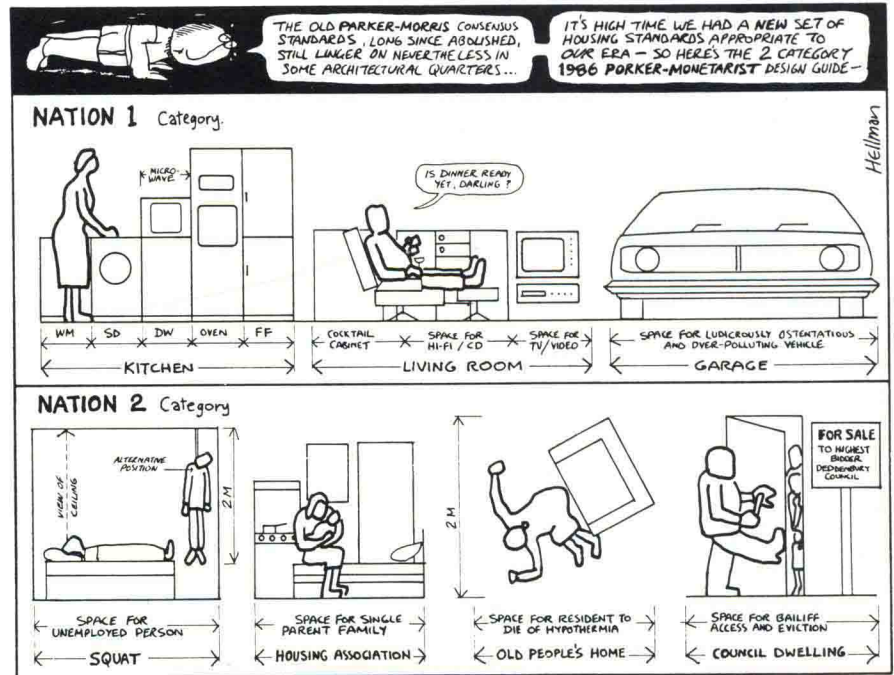
rooms 100sq. ft (9.3 sq. m). A bedroom for two must be over 110sq. ft (10.2sq. m), and two people need a living-room of more than 130sq. ft (12sq. m).

Windows in all bedrooms and living-rooms must be at least one tenth of the floor area in each room—a point which can often affect plans to divide a space up by partition walls. Other rooms do not have to have windows, but must have adequate artificial lighting. Kitchens, bathrooms and w.c.s without windows must have a mechanical ventilation system generating 1.5 air changes every hour.

Any shared bath or shower should be no more than one floor from any user, and there should be at least one

bath or shower for every six people, which sounds like a nightmare in the morning rush. Each place must have its own cold drinking-water supply and a hot and cold water supply to a basin or sink. Shared kitchens are acceptable for single people, with up to three sharing, but again no one should be more than one floor away from the kitchen, which seems very sensible, as does the ruling that every bedroom and living-room should be heated.

Anyone considering building a bed platform should consider the Act's assertion that all rooms must have a minimum ceiling height of 7ft 6in (2.3m), although underground rooms can be 7ft (2.13m) high and only half an attic room need comply with the rule.



## HOW SMALL IS TOO SMALL?

The 1985 Housing Act is the latest chapter in the interesting history of official definitions of small spaces. When the socially conscious London County Council came under pressure from its Finance Committee to cut housing construction costs in 1920, they chose to save money by omitting hand-basins in bathrooms, by leaving parts of their houses unplastered and by cutting room sizes to the following:

Living-room	144sq. ft (13.4sq. m)
Parlour	100sq. ft (9.3sq. m)
Scullery	60sq. ft (5.6sq. m)
Bedroom 1	144sq. ft (13.4sq. m)
Bedroom 2	100sq. ft (9.3sq. m)
Bedroom 3	60sq. ft (5.6sq. m)

The very existence of a 'parlour' may seem luxurious to the occupant of a small space in a modern city. A tiny city apartment can cost much more than a rural mansion, and the phenomenon is an old one. The London figures above compare unfavourably with the desirable minimum room sizes for a rural labourer's cottage recommended in a 1913 report by the Board of Agriculture. The report's encouragement of 'simple elements of good design which are costly only in thought and care' rather than in cash is one any small-space designer could take to heart.

Public housing authorities have a good record in space provision. The Parker Morris report *Homes for Today and Tomorrow* (1961), whose recommended minimal standards set the guidelines for housing in Britain in the 1960s and 1970s, was always more respected in the public than

*The shrinking New York apartment. These two luxury studio apartments were built in 1929 and 1963. Even if you realize that it was designed for at least two people and had a servant's room, the 1929 version is clearly more spacious. Financial pressure applies at all levels of the market. Paul Goldberger, writing in the New York Times, points out the odd contradiction that bedrooms have got smaller, but big beds and built-in furniture are commoner: the walls really are moving in on us.*

