Domestic Nuclear Shelters

Advice on domestic shelters providing protection against nuclear explosions

A Home Office Guide

Domestic Nuclear Shelters

This booklet is a brief guide to three basic kinds of nuclear shelter:

- Simple shelters for short-term indoor or out-door use which can be built from materials already at hand.
- Shelters that can be assembled from do-it-yourself kits.
- Permanent custom-built shelters built into the ground and requiring professional help in design and construction.

Further information

Additional information about protection from nuclear attack is to be found in the booklet *Protect and Survive* available from Her

Majestys Stationery Office and main booksellers or by post from HMSO bookshops.
Detailed technical guidance on shelter design and Construction is available in *Domestic Nuclear Shelters- Technical Guidance* published by HMSO. More detailed description of the effects of nuclear weapons can be found in *Nuclear Weapons* published by HMSO.

The likely effects of a nuclear attack

Light and heat

A nuclear explosion produces an intense flash of light lasting some seconds which would blind anyone seeing it. The heat flash can set fire to buildings up to some distance from the centre of the explosion depending upon the haziness of the atmosphere at the time. Skin exposed to the heat flash could suffer burns. But any shelter that withstands the blast would give protection against the heat flash. Any exposed parts of the shelter made of flammable material could catch fire. Exposed plastic would not catch fire hut might distort in the heat and this could weaken the resistance of the shelter to the subsequent blast wave.

Initial nuclear radiation (INR)

This very penetrating radiation is emitted from the fireball within one minute of the explosion. The distances from one megaton explosions and above, at which people require shielding from INR, are less than those distances at which there would be total destruction.

Blast

At the moment of explosion a blast wave would be generated, travelling at a tremendous speed and creating extremely strong winds which may last for several seconds. When the blast wave passes over a building the sudden increase of pressure and the following wind may cause the building either to explode or collapse.

Tremors

The tremors or shock waves from a ground blast extend for a short distance only and would not affect buildings beyond those already destroyed by the blast. The effect on shelters below the ground would depend on their ability to withstand ground movement and on the nature of the soil. Depth in the ground, shape and flexibility would be important.

Fallout

An explosion on or near the ground sucks up a large amount of earth and debris, which is vaporised as it rises to a great height and becomes high]y radioactive. It then condenses to sand-like particles which are carried along by the wind and drop to the ground. This fallout can come down very near to the explosion or may be carried by the wind for hundreds of miles. The fallout dust is usually visible to the naked eye, but it emits ionising radiation rather like X-rays, which cannot be seen or felt. Radiation is dangerous and heavy doses cause sickness or death. Fallout dust remains radioactive for some days after the explosion - and can, in certain circumstances, still he dangerous after several weeks.

Stocking your shelter

Bombs exploding on or near the ground

When a nuclear weapon explodes on or near the ground, a shock like a small earthquake goes through the ground. The earth vaporised into the fireball leaves a crater around the site of the explosion. The vaporised earth falls to the ground from half an hour to up to about a day later as radioactive fallout.

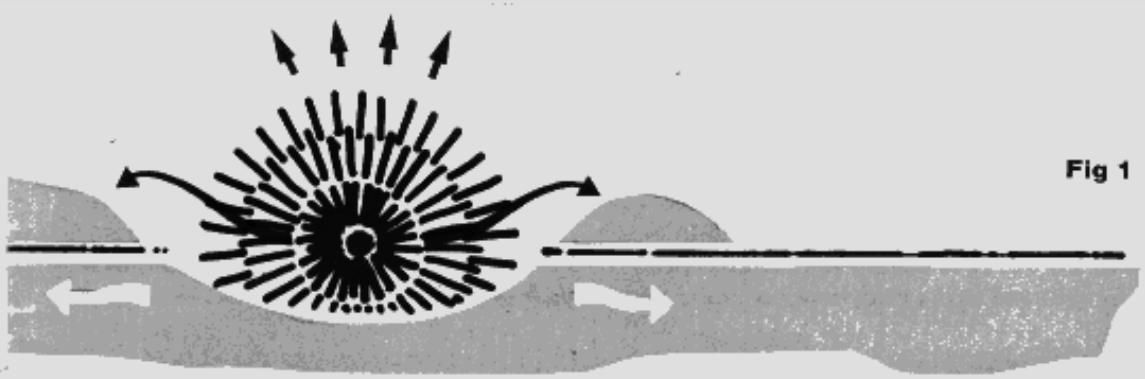


Fig 1

Bombs exploding in the air

When a nuclear bomb explodes in the air the blast effect is more marked. The area affected will be about 30 per cent greater than a ground burst bomb of the same size. But with air-burst weapons there is no dangerous radioactive fallout - since the fireball does not touch the ground no earth is sucked up.

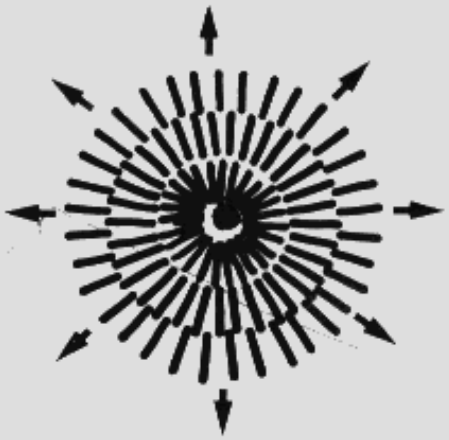
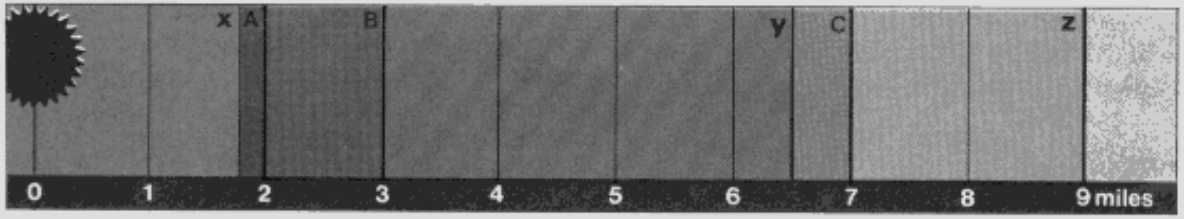


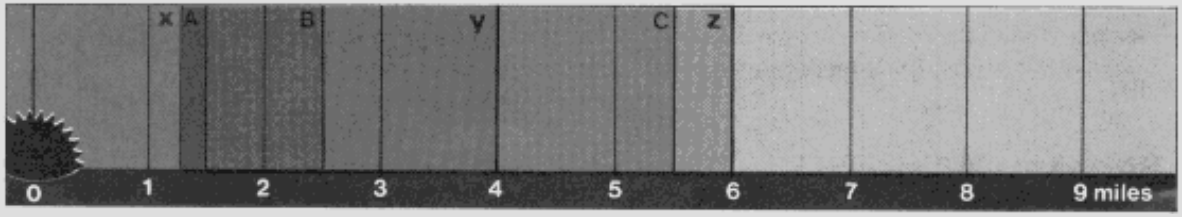
Fig 2

Fig 3 - The extent of blast, fire and INR effects

Air burst (1 megaton)



Ground burst (1 megaton)



Limit of:	**A**	Total destruction	**x**	Approx. range of INR within which shielding is vital	**z**	Blistering to exposed skin
	B	Irreparable damage	**y**	Fire zone		
	C	Severe/moderate damage				

What happens to fallout after a nuclear attack

It is important to remember that the radiation emitted from fallout decreases as time passes, very rapidly at first and more slowly later. For example. after seven hours the radiation emitted will have fallen to one tenth of its strength and after two days to one hundredth.

When the intensity has fallen sufficiently it will be safe to emerge from your shelter for short periods. You will be advised by radio when this is, and for how long you can stay outside. At first it might be safe to spend only an hour or so a day in the open but this safe period will gradually increase until it becomes safe to stay outside all the time. Even in the worst affected areas it might be safe to leave the shelter altogether after about two weeks and in most places this period would be very much shorter.

When outside the shelter no special clothing is required. but it would be advisable to wear outdoor clothing and wellington boots or stout shoes to avoid contamination of your indoor clothes. You should remove these clothes before re-entering the shelter.

The shelters described later on in this booklet offer differing degrees of protection against blast and against fallout. They will also provide protection against the heat flash provided no flammable materials are exposed. No shelter is capable of protecting someone close to the site of a nuclear explosion. but for those who are far enough away to survive the initial effects. The principal danger after the explosion is from radioactive fallout.

Dense material around a shelter will lessen the risk of harm from radiation so long as you remain inside. Essentially the thicker the material the better the protection. But some protective materials are more effective than others.

Below is a list of common materials likely to be used in the construction of a shelter. Their value as protection against radiation is given in terms of the thickness required to reduce radiation by one half thus 2 in. of lead gives the same protection as 3 1/2 in. of slates.

The protection given by buildings or shelters can be expressed as a ***protective factor***. A typical house will reduce the power of the radiation to one fifteenth of that outside - this is called a protective factor of 15. Shelters constructed of the right materials can give a much greater protective factor than this.

Some relative protection values

	Inches		Inches	
LEAD	**0.5**	STONE	**2.2**	**Increased thicknesses of material reduce the intensity of ionising radiation. For example, each 2.2 in. of concrete reduces the intensity by half, so a thickness of 8.8 in. of concrete would reduce the radiation to one sixteenth of its original intensity.**
STEEL	**0.7**	BRICKWORK	**2.8**	
TILES	**1.0 to 1.9**	SAND	**2.9**	
CORRUGATED ASBESTOS SHEET	**2.0**	EARTH	**3.3**	
		PLASTER	**3.5**	

ASPHALT	**2.2**	SLATES	**3.5**
CONCRETE	**2.2**	WOOD	**8.8**

The overall picture

If there were a nuclear attack. it is likely that some bombs might burst in the air. and some on or near the ground. Estimates suggest that around 5 per cent of the land area of the UK might suffer seriously from the effects of blast. We cannot, of course, know in advance where the bombs would fall, but about 80 per cent of the land area might suffer no blast effects at all. Any part of the country might suffer fallout therefore radiation protection would be needed everywhere.

Types of shelters

The section that follows describes four different types of shelter, the kind of protection they offer, and where they can be sited. The examples illustrated are from the detailed designs in *Domestic Nuclear Shelters - Technical Guidance*. It may be possible to vary the materials or the methods of construction shown in this booklet, without reducing the degree of protection provided, but if you propose to do so, check that your shelter will still conform to the guidance in that publication. If you decide to consult someone about a shelter you should check that they are professionally qualified, preferably as an architect or chartered civil/structural engineer.
The Home Office proposes to publish further designs later. These designs will probably include at least one using glass reinforced plastic (fibre glass).

	Type 1 **Improvised**	**Type 2** **Indoor kit**	**Type 3** **Outdoor kit**	**Type 4** **Purpose built**
Blast Protection psi (pounds per square inch)	Up to 1.5	Up to 6	Up to 11	In excess of 11
Fallout Radiation Protection Factor	Not less than 40	Not less than 70	Not less than 200	In excess of 300. Also protects against INR
Distance from a one megaton air burst beyond which shelter will remain intact	7 miles	3 miles	2 miles	Closer than 2 miles depending on design
Ventilation	Natural	Natural or forced	Forced	Forced
Site of installation	In house or garden	In house	In garden. Sectional for access through house	In garden. Appropriate access to garden necessary
Forethought and planning	**Install in crisis.** Some materials can be prepared in advance	Obtain in peace-time. **Install in crisis**	Obtain in peace-time. Install in peace time or crisis (Can be installed as a permanent shelter)	Install in peace-time using professional advice and help

Approximate expected cost (1980)	Nominal if using local materials: scaffold frame about £250	Kit £500-£800 Bricks £300	Kit £900-£1800 Plus any installation costs	£6000-£10,000 (but more sophisticated designs would obviously cost more)

- A garden shelter should preferably be at least half the height of the nearest house away to avoid debris from collapsed buildings. It should also be away from large trees. Before removing earth check that you cannot damage drainage or other services.

Planning permission, Building Regulations and rating

If you wish to install a permanent shelter you may need permission. You should check the regulations *before submitting plans or beginning work*. Your local District Council will tell you about planning permission and the Building Regulations. A permanent shelter may affect the rateable value of your home, and this is a matter for your local District Valuer and Valuation Officer (Regional Assessor in Scotland).

Type 1a

Easily-constructed improvised garden shelter using household materials

This shelter is suitable for areas where under ground shelters are impracticable, for example, where there is a high water table, so that a deep hole fills with water. It can be constructed using only materials which are generally available, and could be *built in a time of crisis*. It would take two people about 24 working hours each to build.
The shelter consists of a shallow trench dug into the ground with a roof of doors or sheet timber that is supported above ground level by earth walls. The structure is then covered by at least 18 in. of earth.
This basic design will give good protection from fallout radiation particularly if the occupants keep away from the entrance area. If, in addition, a barrier of sandbags or packed soil is built about two feet in front of the entrance, and to the same height, the protection in the entrance area will be improved.

Construction

1. Select a site on level ground where there is little chance of rainwater collecting.

2. You will need:

- i. Pick, shovel or spade (preferably both), wheelbarrow or buckets, saw, screw-driver, knife, tape measure, pencil and paper, and a pair of gloves.

  ii. Pieces of large sheeting material. e.g. carpets. blankets. sheets, heavy duty polythene, sacking etc. for making earth rolls (Fig 7).

  iii. Plastic bags or pillowcases for making sandbags.

iv. Timber: pieces of 2 in. x 4 in. wood at least 3 ft long are must useful although any suitable strong timber could be used for the cross braces (Fig 6). Floor-boards about 4 ft long could be used for entrance and exit tunnels (Fig 13).

v. Nails: 100 x 2 in. steel nails, 30 x 4 in. steel nails.

vi. Doors: one door (normally about 30 in. wide) per person is required, together with one door each for entrance and exit. Fittings such as handles should be removed. If you do not have enough doors, sheet timber can be used.

vii. Rainproofing material to cover the doors, e.g. polythene sheeting, shower curtains and vinyl floorcovering .

viii. Pegs and string for markers and tying sandbags.

3. Construct the shelter as shown in Figs 4-14.

4. Furnish the shelter as required.

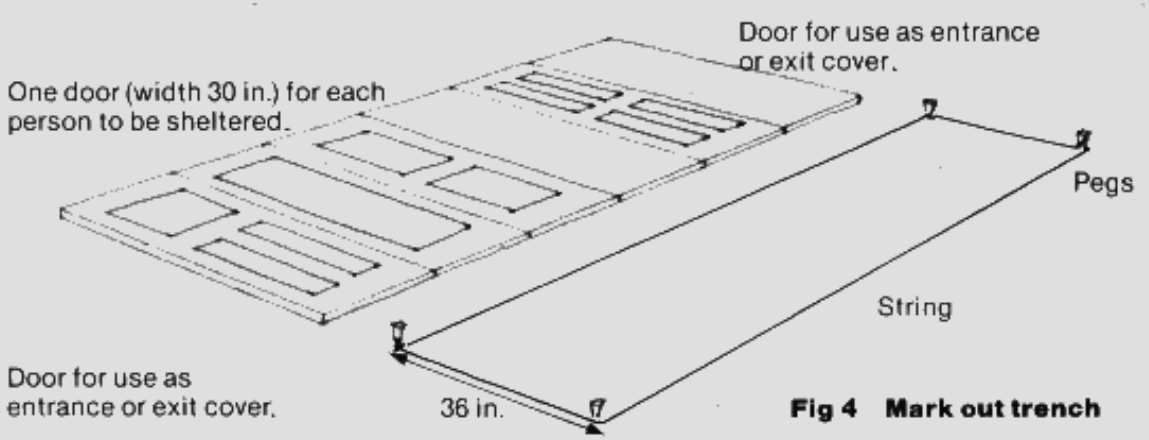
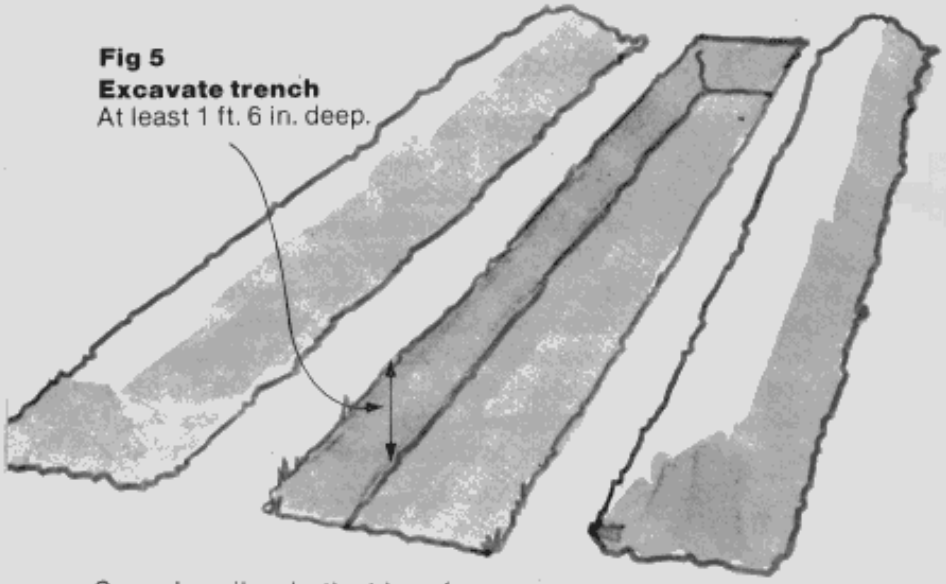


Fig 4 Mark out trench



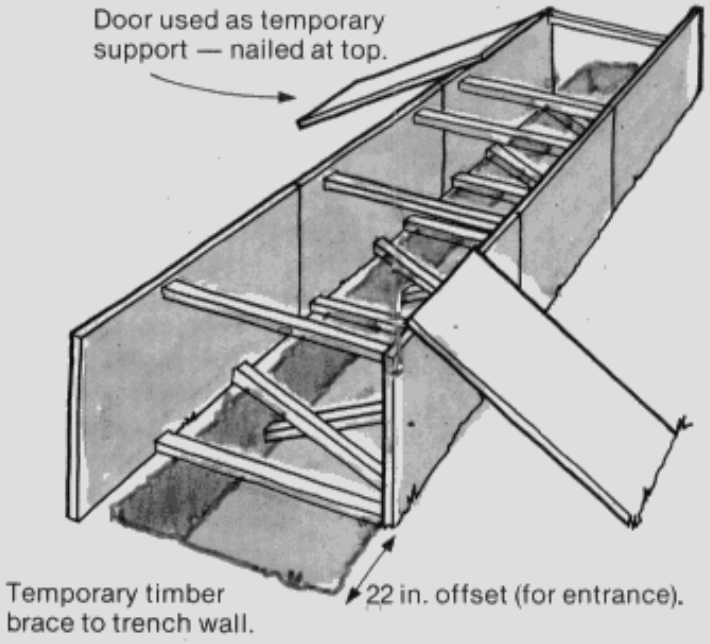


Fig 6 Construct temporary walls

40 in. by 2 in. temporary timber braces between doors.

Doors in position - construct temporary supporting structure of doors and timber against which earth rolls can be built (frame is

removed later and doors, then used to form a roof).

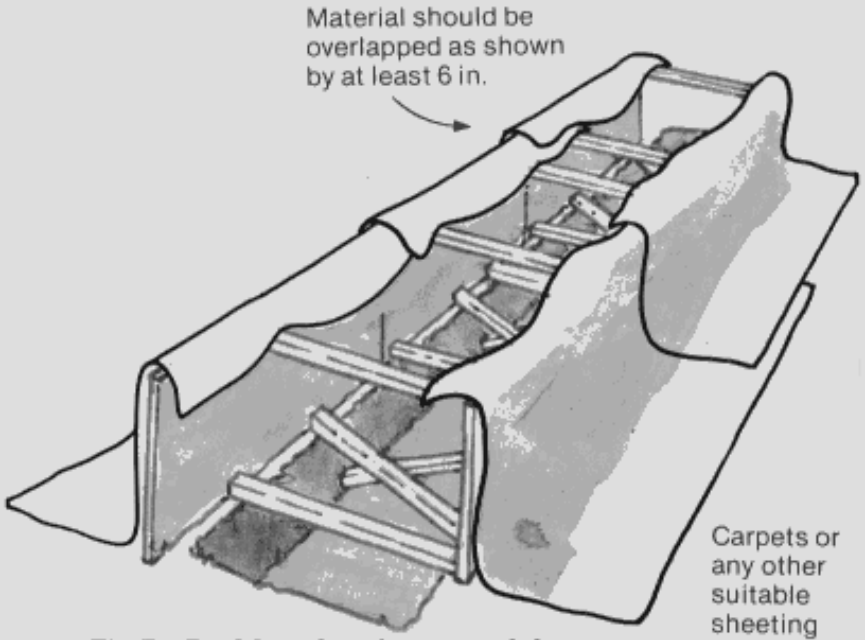


Fig 7 Position sheeting material

Fig 8 - Construction of earth rolls

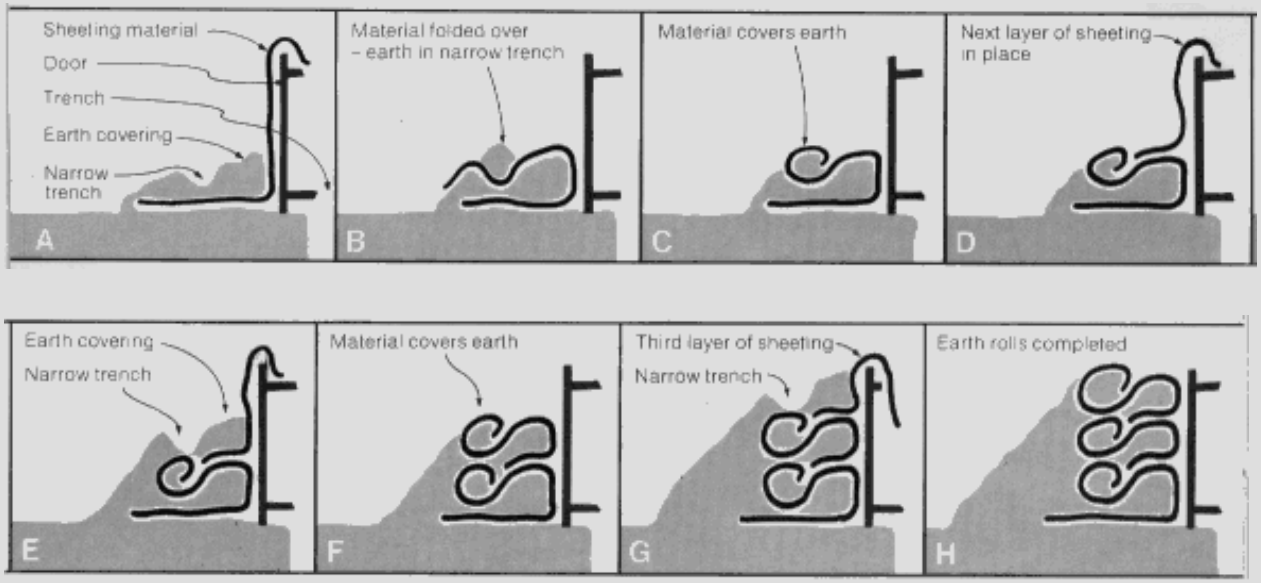


Fig 9 Remove temporary walls

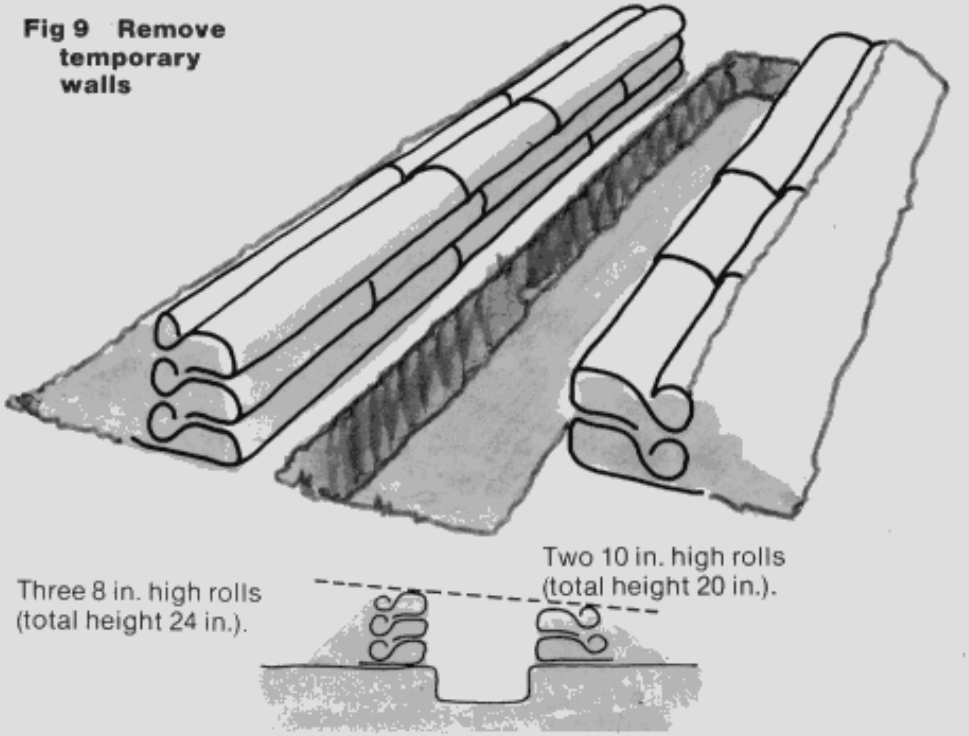


Fig 10 Construct entry/exit frames

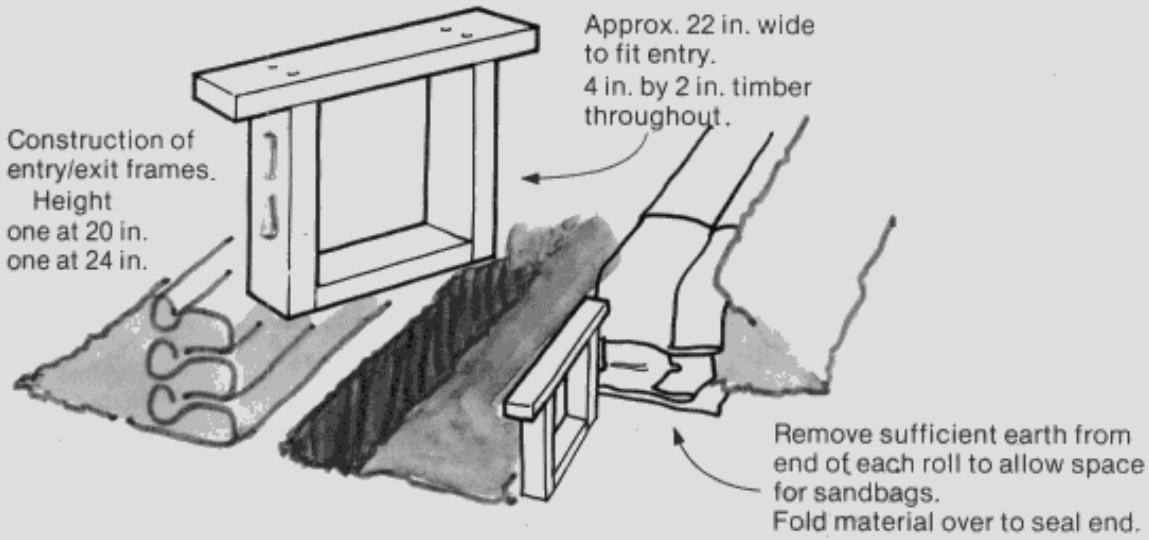
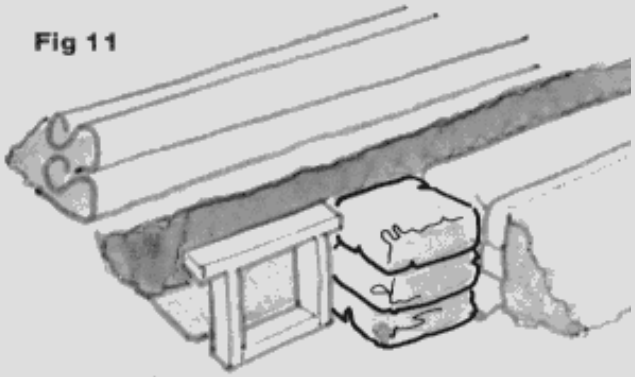
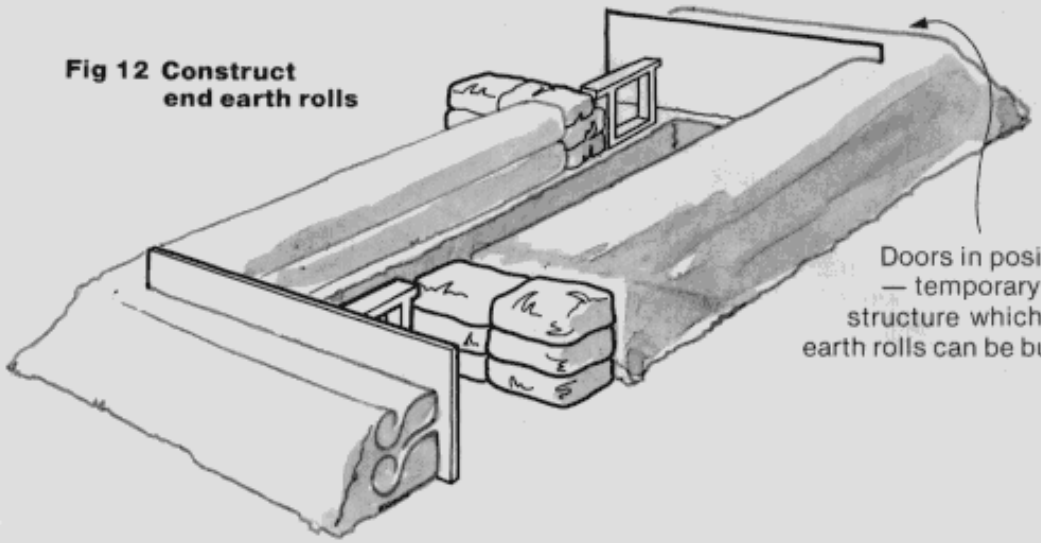


Fig 11



Sandbags will hold material in folded position.

Fig 12 Construct end earth rolls



Doors in position — temporary supporting structure which end earth rolls can be built against.

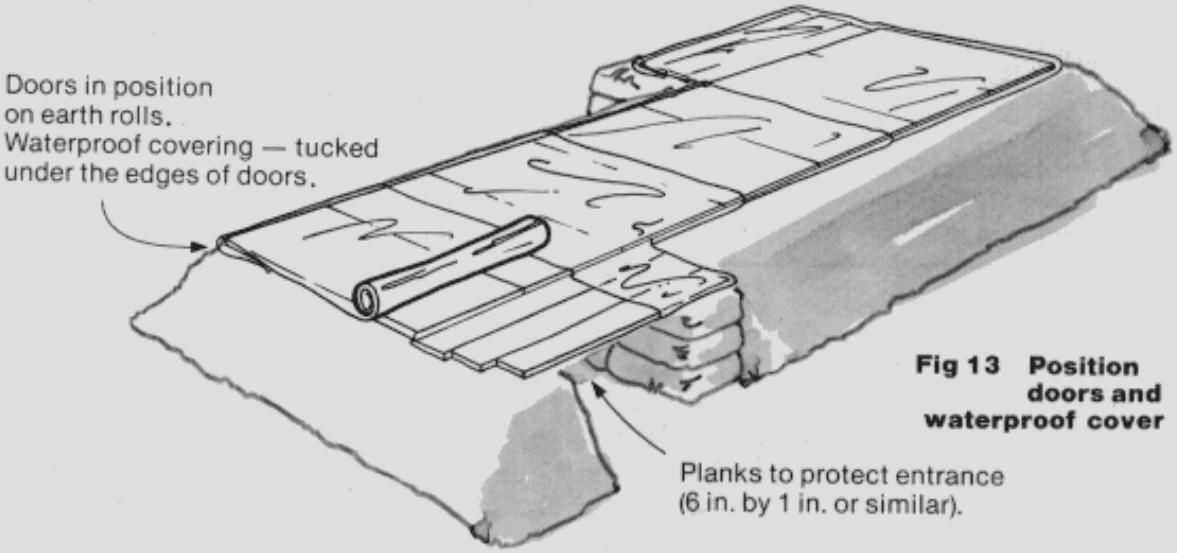


Fig 13 Position doors and waterproof cover

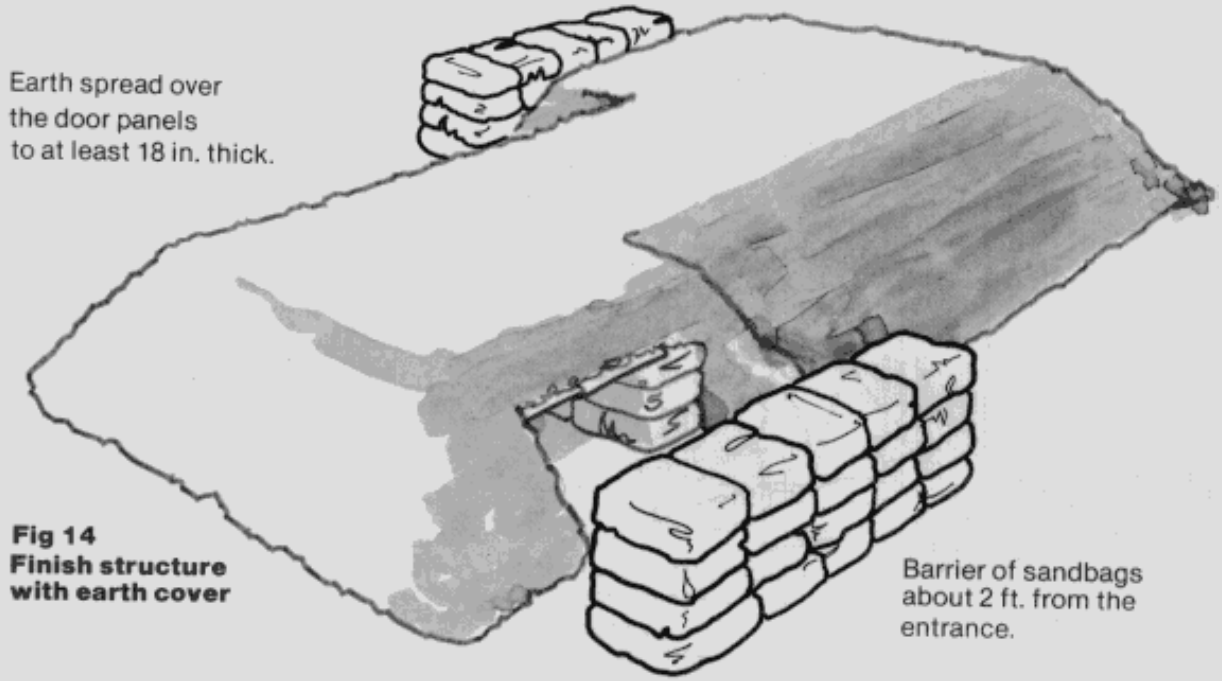


Fig 14 Finish structure with earth cover

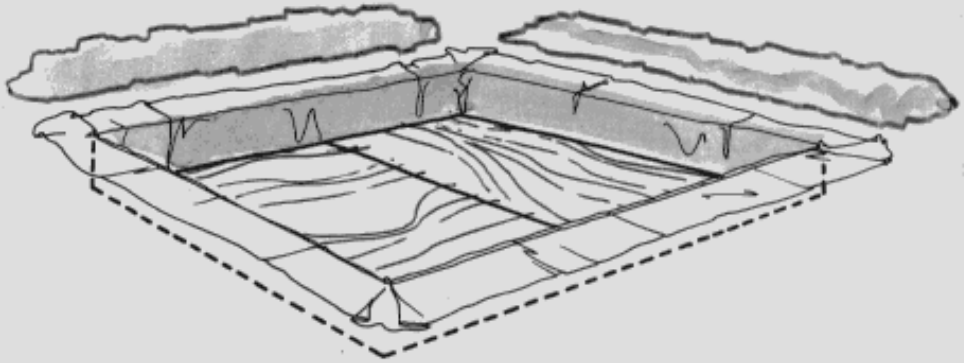
Type 1b

Improvised outdoor shelter using do-it-yourself materials

The following diagrams show how a basic shelter can be constructed from standard scaffold poles and other materials available from builders merchants, timber yards and do-it-yourself stores.
This type of shelter could be constructed in a time of crisis from materials previously purchased and stored. It would take two people about 24 working hours each to build this shelter - the size is adaptable.
The dimensions given would accommodate a family of four for a short period or two people plus provisions for longer.
This shelter uses steel or alloy, standard diameter scaffold poles. These are arranged in a series of 'A' frames over a trench. It is necessary to brace the frames with further scaffolding both diagonally along its length and across the waists of the 'A' sections to give rigidity. In both cases proprietary clamps are the best method of securing the scaffold poles to each other.

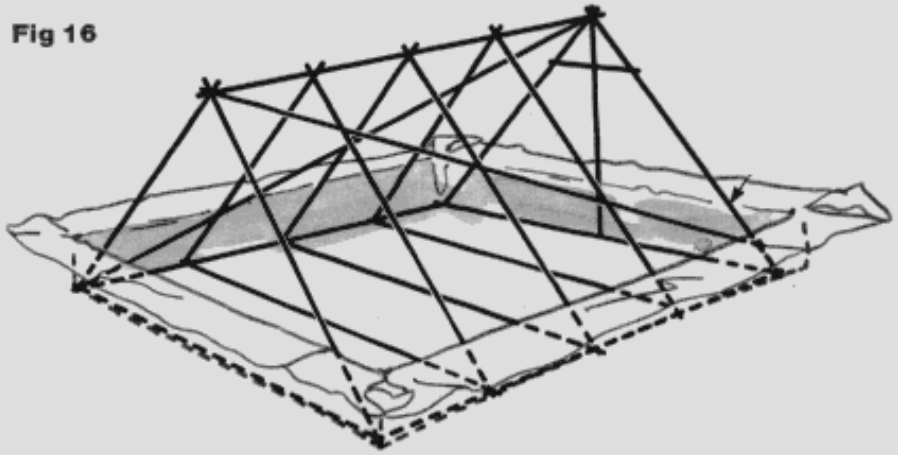
Prepare a trench 8 ft. x 8 ft. and at least 1 ft. 6 in. deep. Line it with heavy duty polythene sheeting. Lay a floor of two sheets of plywood, 3/4 in. thick and 4 ft. x 8 ft.

Fig 15



Construct the frame of scaffold poles (or you could use wood). This should be as strong as you can make it. You can increase the strength with vertical and diagonal bracing, or crossbars.

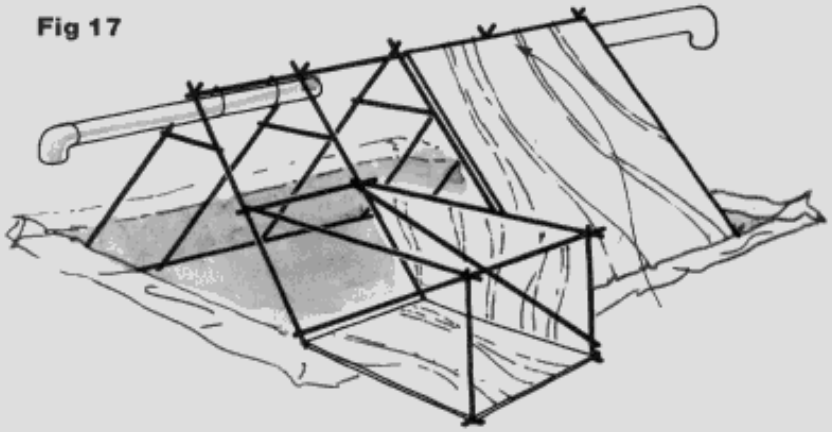
Fig 16



Add the frame for the entrance tunnel, and also the ventilation pipe (described opposite).

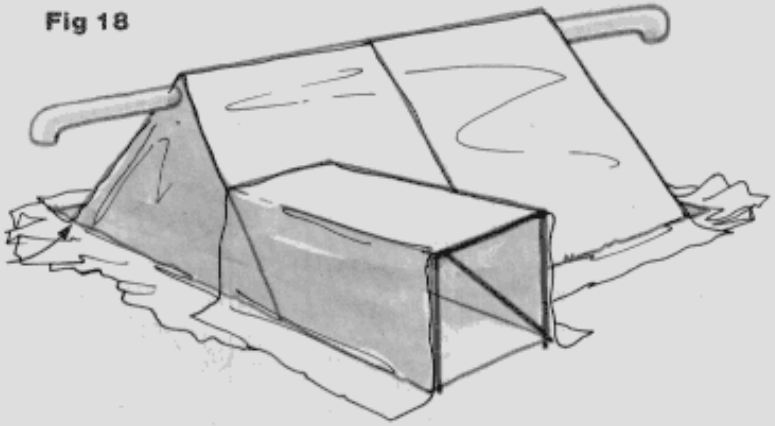
Cover the entire frame (except the entrance hole) with plywood boarding. Any small gaps or sharp edges should be covered with carpet or thick fabric.

Fig 17



Wrap the shelter with overlapping sheets of heavy duty polythene. Make sure the trench lining is within this cover.

Fig 18



Finally, cover the shelter with a thick layer of earth (about 18 in.). The earth removed from the trench may not be enough for this. It you decide to dig a deeper initial trench to get enough earth to cover, you may need to make some modifications to the design given here.

The shelter will give better blast protection if you put a layer of resilient material between the polythene and the earth covering. Straw, mattresses, or similar, would be suitable.
The entrance can be filled from within with small bags of sand or earth. You will have to store these inside the shelter.

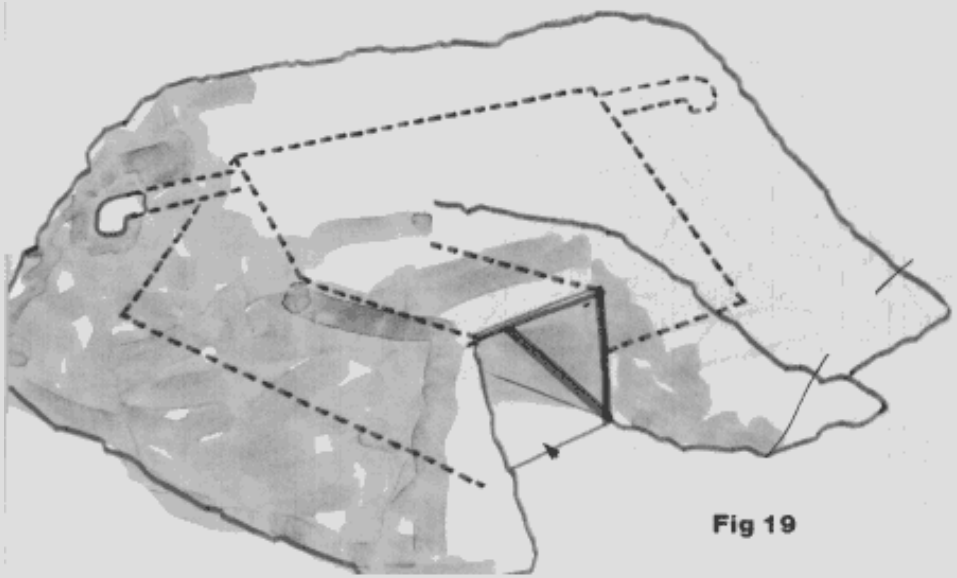
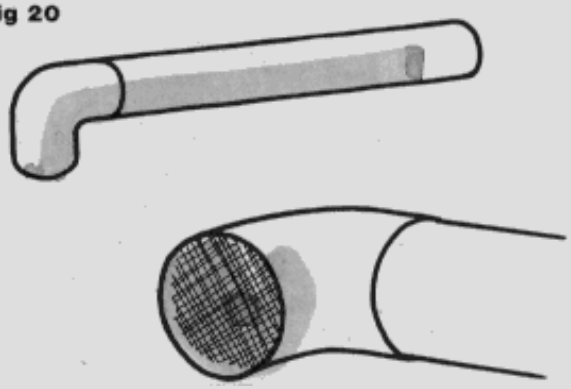


Fig 19

Ventilation

For this shelter you will need to make some provision for ventilation. The diagrams show metal drainpipes with a bend near the opening, so that this faces downward. The opening should then be filled with a filter of steel wool. It is extremely important to ensure that ventilation pipes are secure and kept free of obstruction.

Fig 20

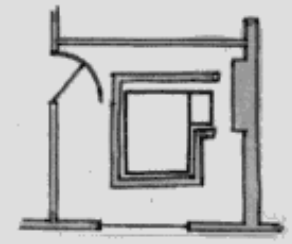


The following two designs are intended to be sold by manufacturers as kits together with installation instructions. Design drawings are to be found in *Domestic Nuclear Shelters - Technical Guidance*.

Type 2

Indoor shelter from manufactured kit

This type of shelter - basically a protective steel table - is suitable for homes that have basements or rooms that can be converted into 'fallout rooms' (described in Protect and Survive) provided that the floor is strong enough to support it.
This shelter will sustain the debris load resulting from the complete collapse of a normal two-storey house. To obtain protection from fallout, it must be surrounded with dry-laid bricks, sand or earth bags or heavy furniture filled with sand, earth or books.
The shelter is designed to accommodate two adults and two children. Two shelters or more may be put together to increase the capacity.
It would take two people about two hours to erect the shelter itself and up to an additional 20 hours to surround it with protective material.



Plan of shelter in 'fallout room'.

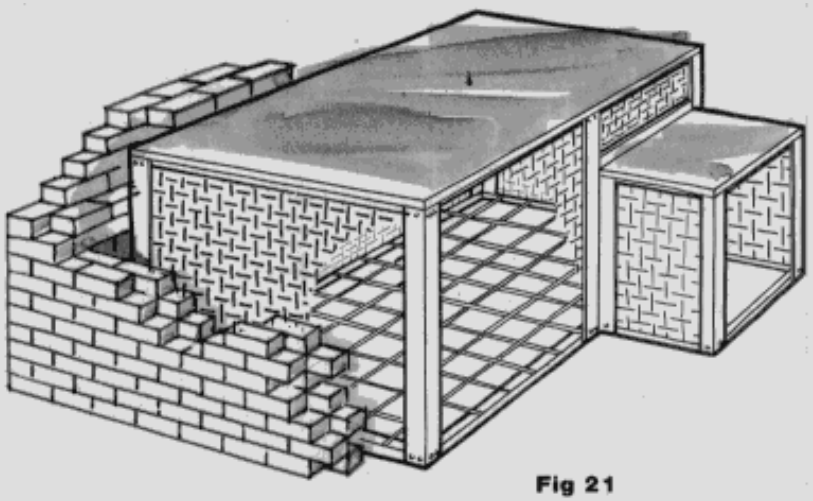


Fig 21

Type 3

Outdoor shelter from a manufactured kit

This type of shelter is generally suitable where there is a garden or other convenient land near the living accommodation. It is formed by building a strong structural shell with prefabricated steel components bolted together to form a sealed room of sufficient size for up to six people. The shell is semi-sunk in the ground and covered entirely by earth from the excavation.
There will be variations both in materials and construction depending upon the costs. The assembly of the shell would take a full days work for two people. The excavation could, however, take at least a week for two people digging by hand.
While the kit could be bought in readiness and digging and installation done over a period of time the materials would have to be non-corrosive, and not likely to deteriorate.

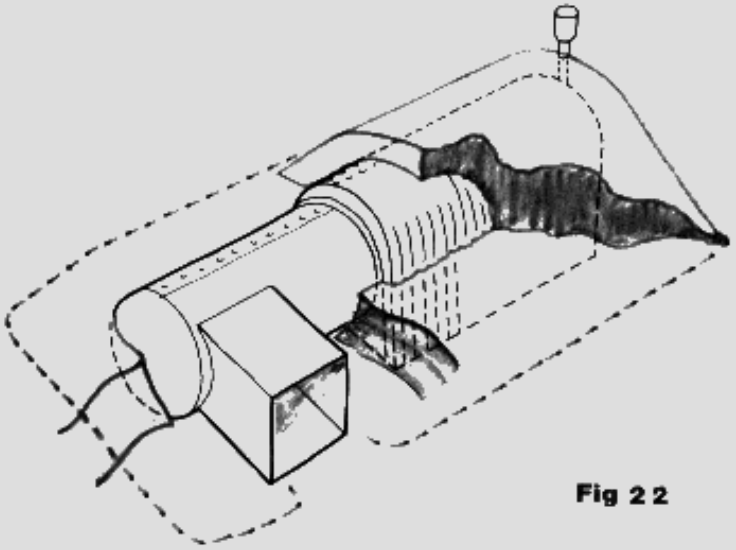


Fig 2 2

Type 4

Permanent purpose-built shelter

This reinforced concrete shelter must be erected by a building contractor under the guidance of a chartered civil/structural engineer. It should on no account be erected by unskilled or unsupervised labour.
If properly constructed it will give a high degree of protection against both blast and radiation. It can be designed to accommodate from six to 12 people and the cost will vary accordingly.

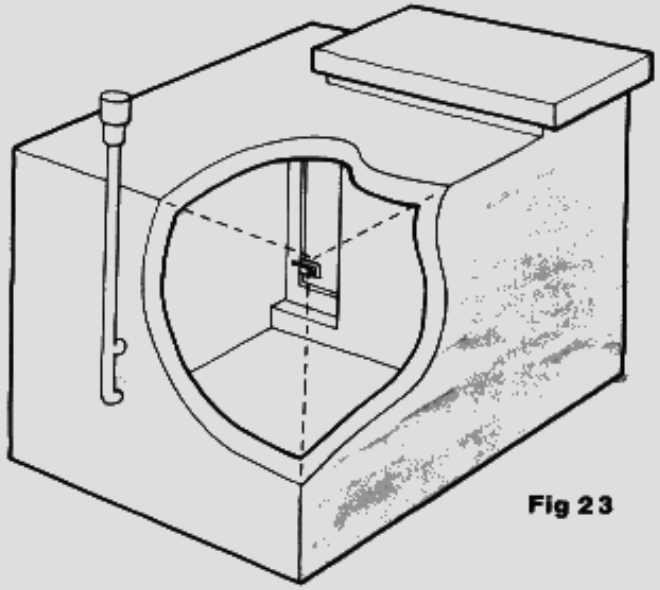


Fig 23

Stocking your shelter

Life in the confined space of a survival shelter needs careful planning.

You should store as much as possible of the following in your shelter:

Water

Water in sealed or covered containers to last you and your family for 14 days. Four pints per person per day would be sufficient for drinking and basic cleanliness.

Food

Enough food for 14 days, including tinned or powdered milk for the children and food for the baby - and a closed cupboard or cabinet in which to store these supplies.
A nutritionally balanced diet is not important for this length of time. A list of suggested foods and quantities for one adult is given at the back of this booklet. These have been chosen because they store easily and most can be eaten cold.
Nursing mothers will need extra food and children between the ages of one and five years should be counted as half an adult for the purposes of food stocks. They should also have the equivalent in dried or evaporated milk of one pint of milk per day. If your family includes a baby that is not breast fed you should provide dried infant formula.
Alternatives to this are 7kg of full cream evaporated milk and 1/2kg sugar or 2 1/2kg full cream dried milk and 1/2kg sugar, which should be sufficient for two weeks. To this can be added mashed 'adult' foods if the infant is more than three or four months old.

Radio

A portable radio (and a spare if possible) and spare batteries.
This is absolutely essential. It will be your only way of receiving instructions on when it is sate to leave your shelter and for how long. In the case of shelter types 3 and 4 an external aerial may be necessary.

Miscellaneous

Tin opener, bottle opener, cutlery, crockery and cooking utensils.

Warm clothing and footwear and changes of clothing.

Bedding. sleeping bags, etc.

Torches with spare bulbs and batteries, candles and matches. Open flames should not be used in shelter types 3 and 4 until the shelter door can be opened.

Toilet articles and washbowls.

First aid kit.

Notebooks and pencils for noting radio instructions.

Cleaning materials: including cloths, tissues, brushes, shovels and box of dry sand.

Garden spade

Improvised lavatory seat, polythene buckets fitted with covers, polythene bag linings for emptying the contents, strong disinfectant and toilet paper. Alternatively camping or caravan type toilet arrangements may be used.

Clock and calendar.

and just outside your shelter

Dustbin for temporary storage of waste matter.

Second dustbin for food remains. empty tins and other rubbish.

Polythene bag or bin for outdoor clothes and boots.

If possible. extra water supplies in covered containers, and games, children's toys and books.

Stoves burning liquid fuel or gas may be used at or just outside the entrance of shelter types 1, 1a and 2, or in a similar way in types

lb, 3 and 4 but only when it is safe to open the hatch or door. Otherwise you should not use a stove of this kind in a sealed shelter.

Suggested food list

Supplies for two weeks for one adult

Biscuits, crackers, breakfast cereals etc.	2750g (6 lb)*
Canned meat or fish (e.g. corned beef, luncheon meat, stewed steak, pilchards, sardines)	2000g (4¼ lb)
Canned vegetables (e.g. baked beans, carrots, potatoes, sweetcorn etc.)	1800g (4 lb)
Canned margarine or butter, or peanut butter	500g (1 lb)
Jam, marmalade, honey or spread	500g (1 lb)
Canned soups	6 cans
Full cream evaporated milk or dried milk	14 small cans or 2 x 300g(1/2 lb) containers
Sugar	700g (1 1/2 lb)
Tea or coffee (instant)	250g (1/2 lb)
Boiled sweets or other sweets	450g (1 lb)
Canned fruit, fruit juices, fruit squash, drinking chocolate	If sufficient storage space is available
Approximate cost (mid 1980)	£15-£20

* Imperial equivalents are only approximate.

This list is based on the assumption that cooking will not be possible and that the opportunities for warming foods or boiling water may be limited. For further details see *Domestic Nuclear Shelters - Technical Guidance*.

Protect and survive

Keep this booklet handy

Further reading
A booklet, *Nuclear Weapons* (ISBN 0 II 340557 X), published by Her Majesty's Stationery Office, is also available. It contains detailed information about the effects of nuclear weapons and will be of interest to those who wish to further their knowledge of the subject.

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Home

Protect and Survive

This booklet tells you how to make your home and family as safe as possible under nuclear attack

Foreword

If the country were ever faced with an immediate threat of nuclear war, a copy of this booklet would be distributed to every household as part of a public information campaign which would include announcements on television and radio and in the press. The booklet has been designed for free and general distribution in that event. It is being placed on sale now for those who wish to know what they would be advised to do at such a time.

May 1980

If Britain is attacked by nuclear bombs or by missiles, we do not know what targets will be chosen or how severe the assault will be.

If nuclear weapons are used on a large scale, those of us living in the country areas might be exposed to as great a risk as those in the towns. The radioactive dust, falling where the wind blows it, will bring the most widespread dangers of all. No part of the United Kingdom can be considered safe from both the direct effects of the weapons and the resultant fall-out.

The dangers which you and your family will face in this situation can be reduced if you do as this booklet describes.

Read this booklet with care
Your life and the lives of your family may depend upon it

Do as it advises
Keep it safely at hand

1 Challenge to survival

Everything within a certain distance of a nuclear explosion will be totally destroyed. Even people living outside this area will be in danger from -

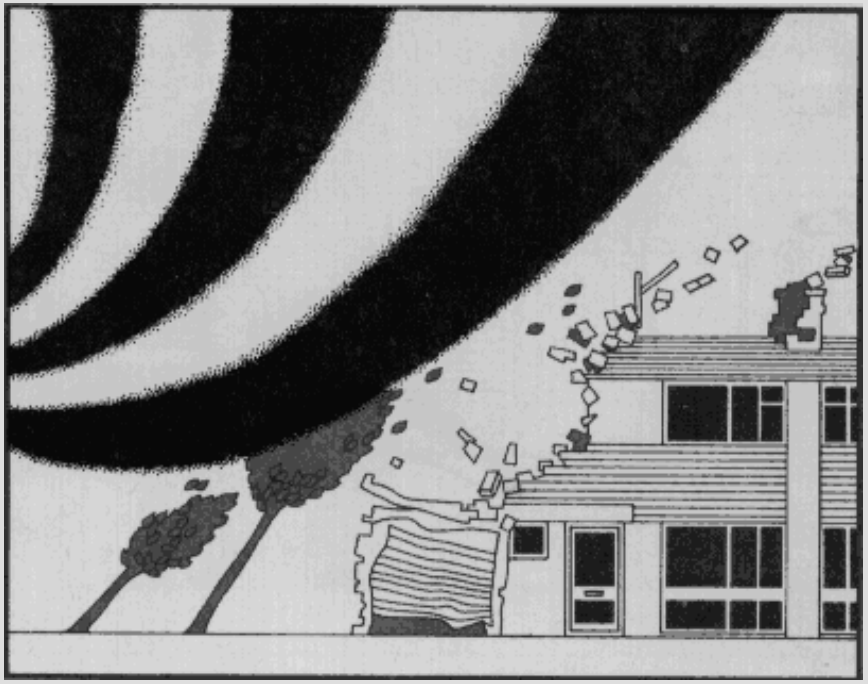
---

HEAT AND BLAST

FALL-OUT

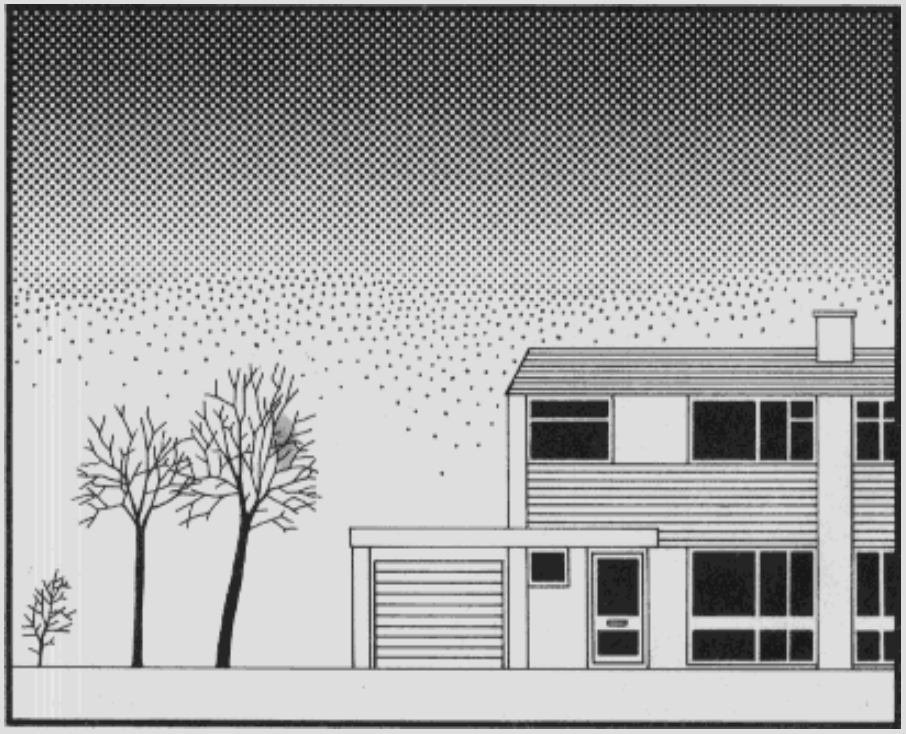
Heat and Blast

The heat and blast are so severe that they can kill, and destroy buildings, for up to five miles from the explosion. Beyond that, there can be severe damage.



Fall-out

Fall-out is dust that is sucked up from the ground by the explosion. It can be deadly dangerous. It rises high in the air and can be carried by the winds for hundreds of miles before falling to the ground.
The radiation from this dust is dangerous. It cannot be seen or felt. It has no smell, and it can be detected only by special instruments. Exposure to it can cause sickness and death. If the dust fell on or around your home, the radiation from it would be a danger to you and your family for many days after an explosion. Radiation can penetrate any material, but its intensity is reduced as it passes through - so the thicker and denser the material is, the better.



2 Planning for survival

Stay at Home

Your own local authority will best be able to help you in war. If you move away - unless you have a place of your own to go to or intend to live with relatives - the authority in your new area will not help you with accommodation or food or other essentials. If you leave, your local authority may need to take your empty house for others to use.
So stay at home.

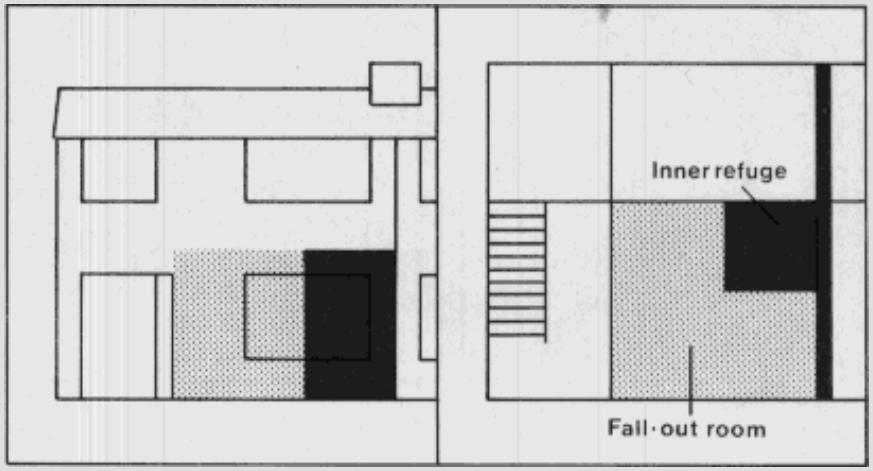
Plan a Fall-out Room and Inner Refuge

The first priority is to provide shelter within your home against radioactive fall-out. Your best protection is to make a fall-out room and build an inner refuge within it.

First, the Fall-out Room

Because of the threat of radiation you and your family may need to live in this room for fourteen days after an attack, almost without leaving it at all. So you must make it as safe as you can, and equip it for your survival. Choose the place furthest from the outside walls and from the roof, or which has the smallest amount of outside wall. The further you can get, within your home, from the

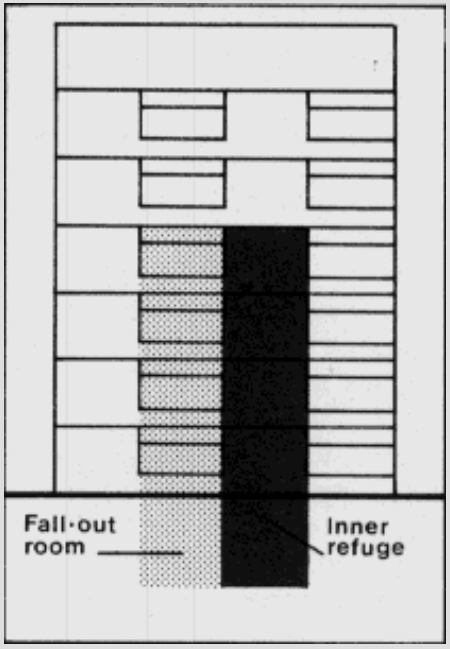
radioactive dust that is on or around it, the safer you will be. Use the cellar or basement if there is one. Otherwise use a room, hall or passage on the ground floor.



Even the safest room in your home is not safe enough, however. You will need to block up windows in the room, and any other openings, and to make the outside walls thicker, and also to thicken the floor above you, to provide the strongest possible protection against the penetration of radiation. Thick, dense materials are the best, and bricks, concrete or building blocks, timber, boxes of earth, sand, books, and furniture might all be used.

Flats

If you live in a block of flats there are other factors to consider. If the block is five stories high or more, do not shelter in the top two floors. Make arrangements now with your landlord for alternative shelter accommodation if you can, or with your neighbours on the lower floors, or with relatives or friends.
If your flat is in a block of four storeys or less, the basement or ground floor will give you the best protection. Central corridors on lower floors will provide good protection.

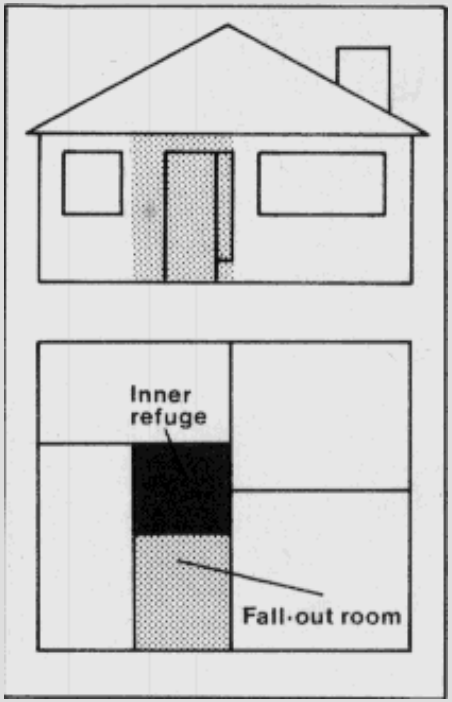


Bungalows

Bungalows and similar single-storey homes will not give much protection. Arrange to shelter with someone close by if you can do so.
If not, select a place in your home that is furthest from the roof and the outside walls, and strengthen it as has been described.

Caravans

If you live in a caravan or other similar accommodation which provides very little protection against fall-out your local authority will be able to advise you on what to do.

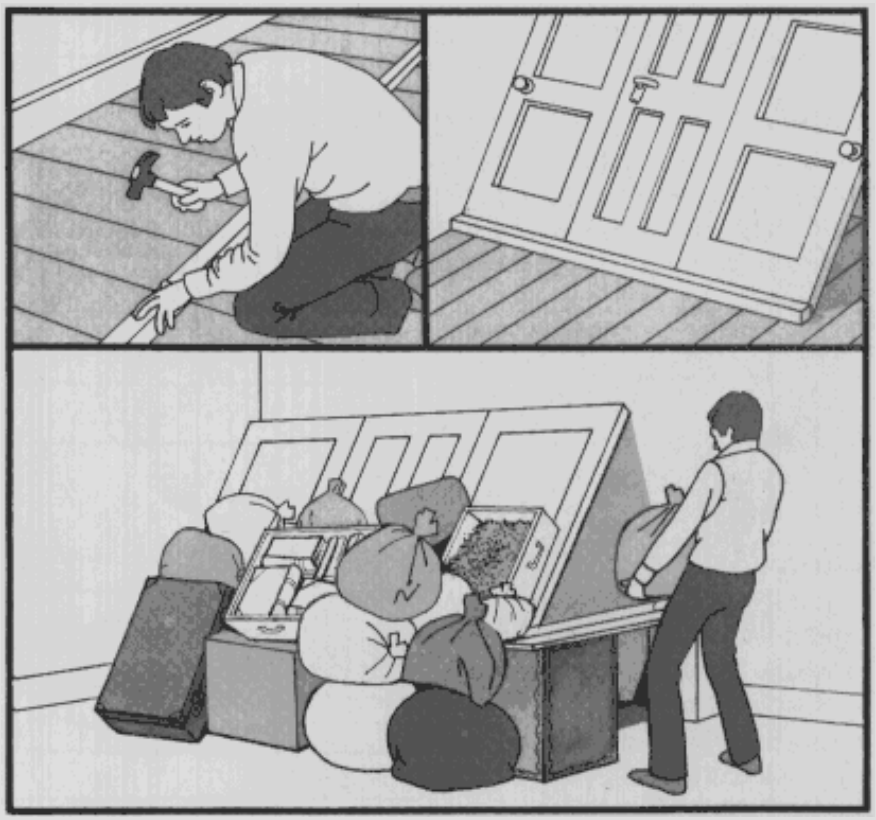


Now the Inner Refuge

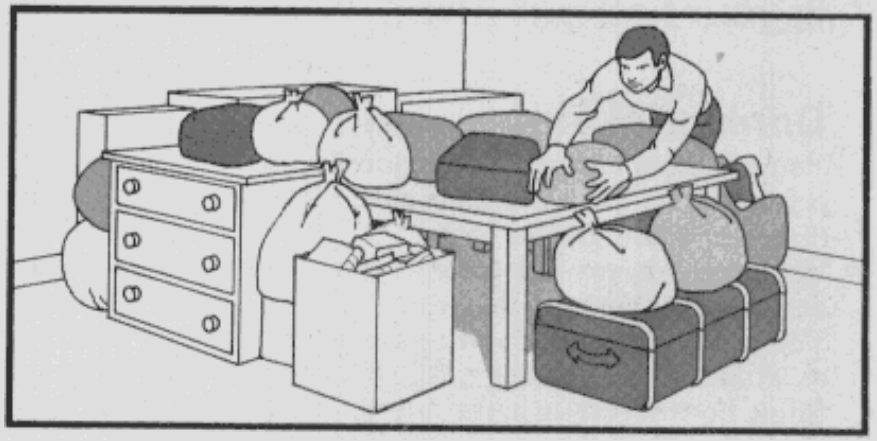
Still greater protection is necessary in the fall-out room, particularly for the first two days and nights after an attack, when the radiation dangers could be critical. To provide this you should build an inner refuge. This too should be thick-lined with dense materials to resist the radiation, and should be built away from the outside walls.

Here are some ideas:

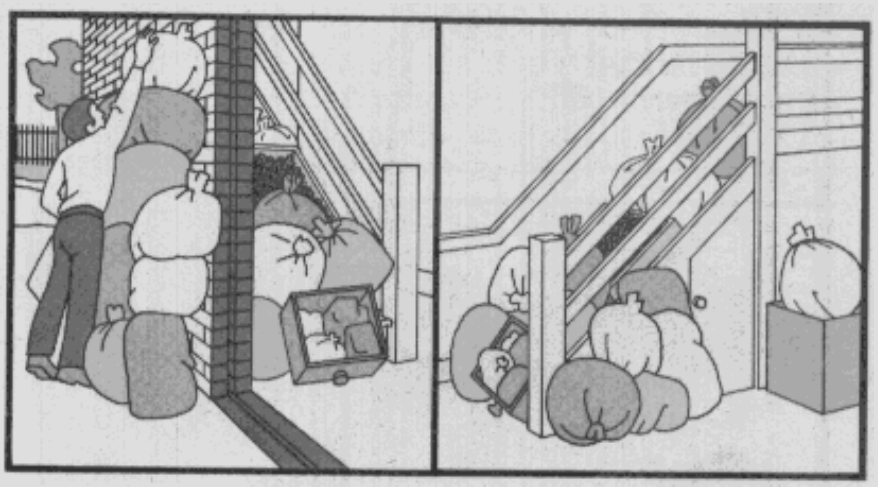
1. Make a 'lean-to' with sloping doors taken from rooms above or strong boards rested against an inner wall. Prevent them from slipping by fixing a length of wood along the floor. Build further protection of bags or boxes of earth or sand - or books, or even clothing - on the slope of your refuge, and anchor these also against slipping. Partly close the two open ends with boxes of earth or sand, or heavy furniture.



2. Use tables if they are large enough to provide you all with shelter. Surround them and cover them with heavy furniture filled with sand, earth, books or clothing.



3. Use the cupboard under the stairs if it is in your fall-out room. Put bags of earth or sand on the stairs and along the wall of the cupboard. If the stairs are on an outside wall, strengthen the wall outside in the same way to a height of six feet.

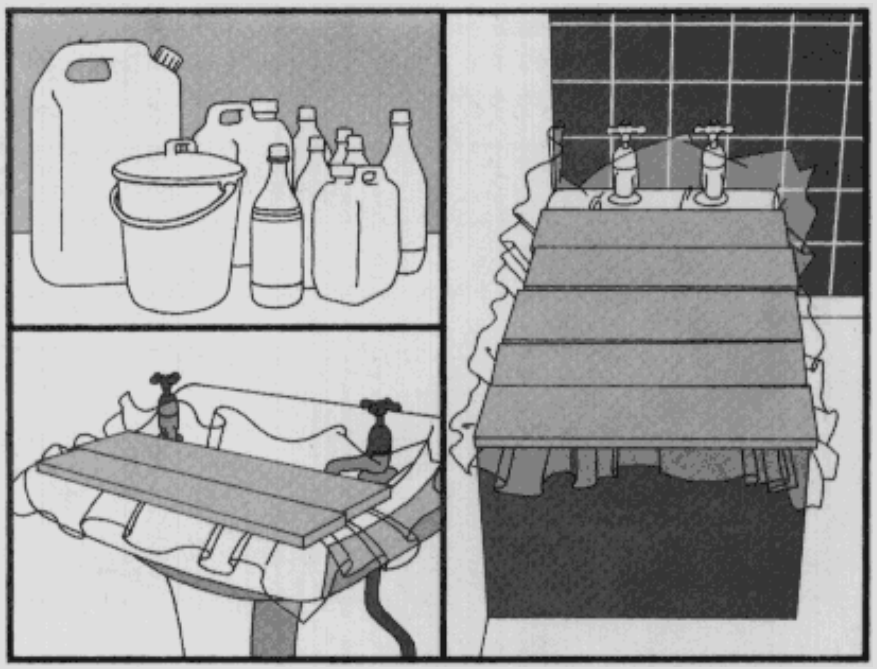


PLAN YOUR SURVIVAL KIT

Five essentials for survival in your Fall-out Room

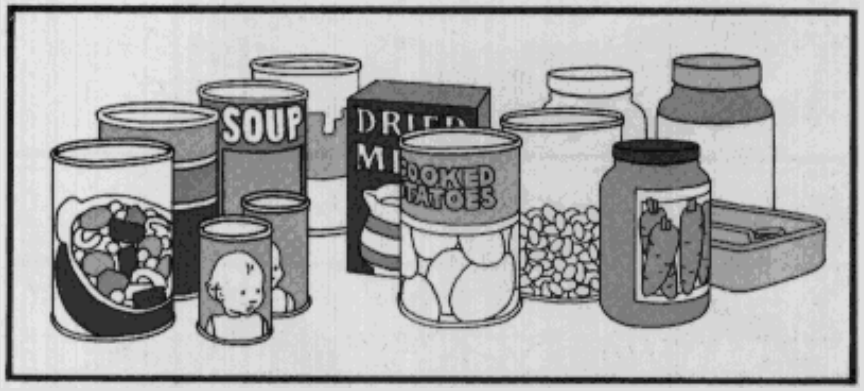
1 Drinking Water

You will need enough for the family for fourteen days. Each person should drink two pints a day - so for this you will need three and a half gallons each.
You should try to stock twice as much water as you are likely to need for drinking, so that you will have enough for washing. You are unlikely to be able to use the mains water supply after an attack - so provide your drinking water beforehand by filling bottles for use in the fall-out room. Store extra water in the bath, in basins and in other containers.
Seal or cover all you can. Anything that has fall-out dust on it will be contaminated and dangerous to drink or to eat. You cannot remove radiation from water by boiling it.



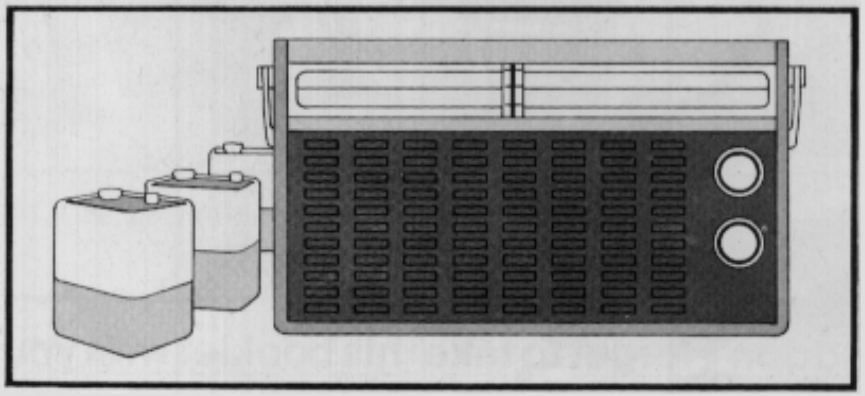
2 Food

Stock enough food for fourteen days.
Choose foods which can be eaten cold, which keep fresh, and which are tinned or well wrapped. Keep your stocks in a closed cabinet or cupboard.
Provide variety. Stock sugar, jams or other sweet foods, cereals, biscuits, meats, vegetables, fruit and fruit juices. Children will need tinned or powdered milk, and babies their normal food as far as is possible. Eat perishable items first. Use your supplies sparingly.

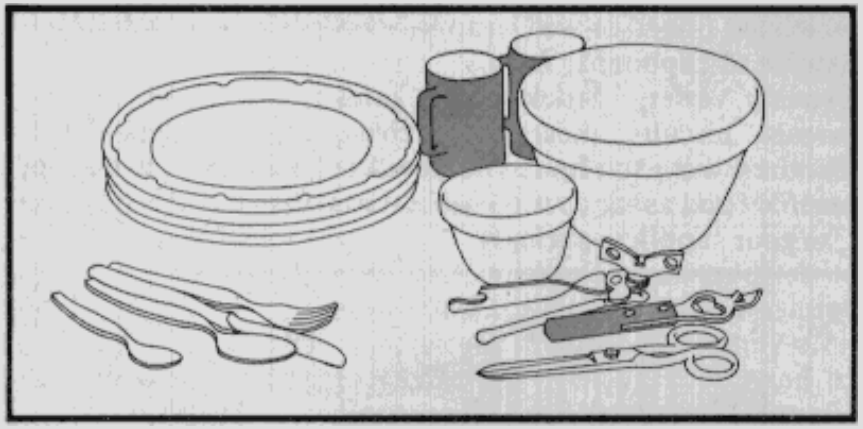


3 Portable Radio and Spare Batteries

Your radio will be your only link with the outside world. So take a spare one with you if you can. Keep any aerial pushed in. You will need to listen for instructions about what to do after the attack and while you remain in your fall-out room.



4 Tin Opener, Bottle Opener, Cutlery and Crockery

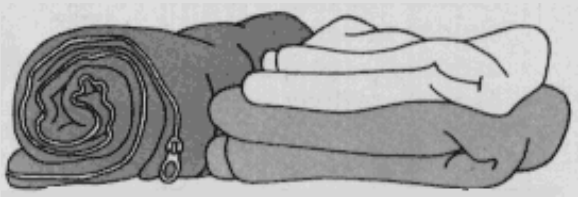


5 Warm Clothing

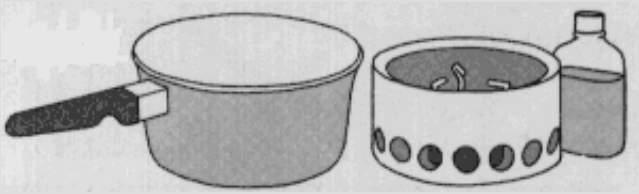
And don't forget to take this booklet with you

These further items will also be useful in the Fall-out Room:

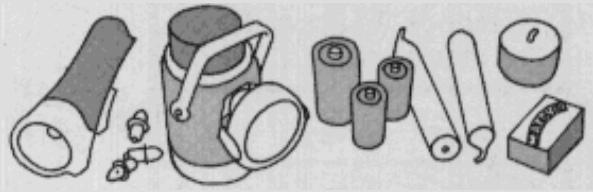
6. Bedding, sleeping bags



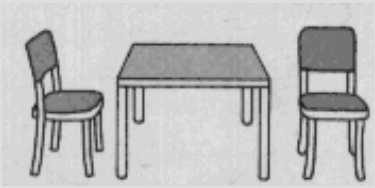
7. Portable stove and fuel, saucepans



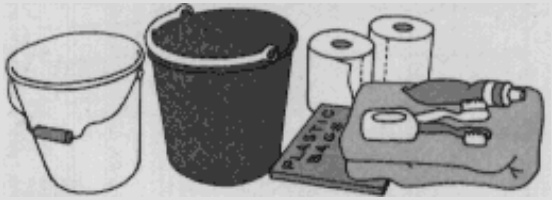
8. Torches with spare bulbs and batteries, candles, matches



9. Table and chairs



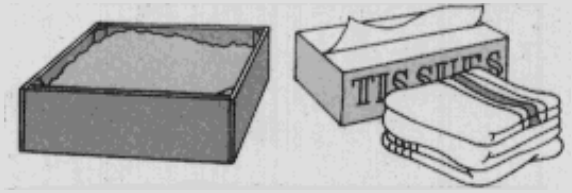
10. Toilet articles soap, toilet rolls, bucket and plastic bags (see Sanitation)



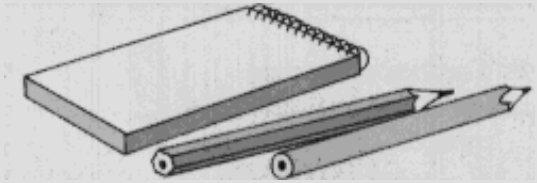
11. Changes of clothing

12. First aid Kit - with household medicines and prescribed medicines. And at least aspirins or similar tablets, adhesive dressings, cotton wool, bandages, disinfectant, ointment, including 'Vaseline'

13. Box of dry sand, cloths or tissues for wiping plates and utensils

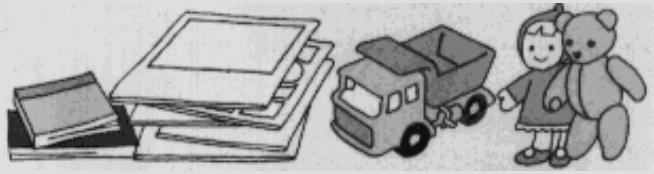


14. Notebook and pencils for messages

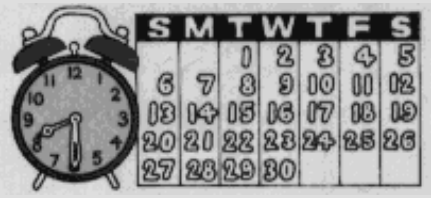


15. Brushes, shovels and cleaning materials, rubber or plastic gloves, dustpan and brush

16. Toys and magazines



17. Clock (mechanical) and calendar

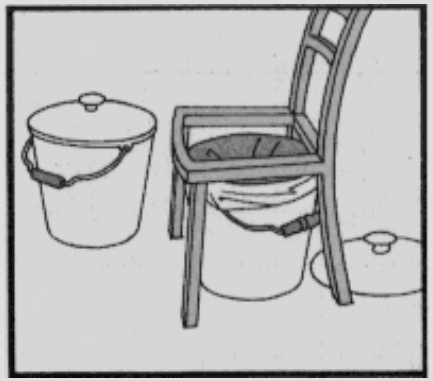


Sanitation

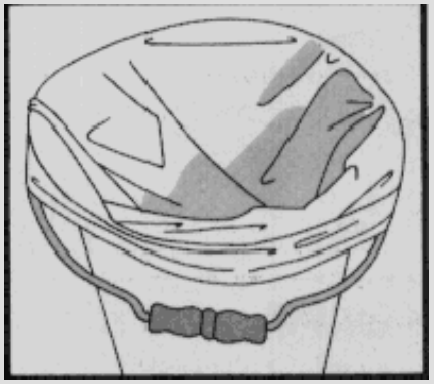
You will need special sanitation arrangements because there will be no water to waste in lavatories.

Keep these items in the Fall-out Room:

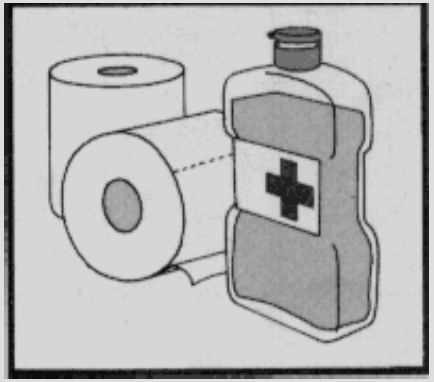
Containers such as polythene buckets, fitted with covers and - if possible - improvised seats.



Polythene bag linings for emptying the containers.

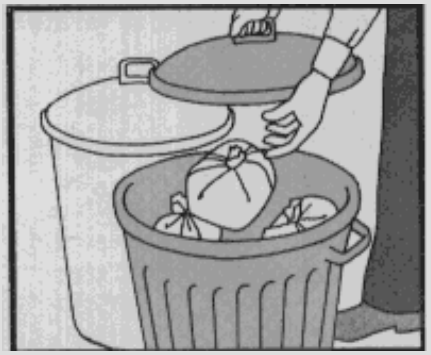


Strong disinfectant and toilet paper.



Keep these items just outside the Fall-out Room:

A dustbin for the temporary storage of sealed bags of waste matter



A second dustbin for food remains, empty tins and other rubbish

If you have only one dustbin, use that for toilet waste only. Put all other rubbish in plastic bags or paper until you can take it outside the house.

Limit the Fire Hazards

As you plan the fall-out room and the inner refuge you need also to limit as far as you can the dangers from heat and blast to the rest of the house. Though the heat could not ignite the bricks and stone of your home it could set alight the contents by striking through unprotected windows.
There are things you can do now to lessen these risks -
Remove anything which may ignite and burn easily (paper and cardboard, for example) from attic and upper rooms where fire is most likely.
Remove net curtains or thin materials from windows - but leave heavy curtains and blinds as these can be drawn before an attack as protection against flying glass.
Clear out old newspapers and magazines.
Coat windows inside with diluted emulsion paint of a light colour so that they will reflect away much of the heat flash, even if the blast which will follow is to shatter them.
If you have a home fire extinguisher - keep it handy.
Keep buckets of water ready on each floor.
Remove boxes, firewood and materials which will burn easily which are close to the outside of the house.
Keep any remaining doors closed to help prevent the spread of fire.
In an attack, damage to gas, oil and electricity systems could add serious fire and other hazards. All responsible members of your family should therefore know where and how to turn off gas and electricity at the mains, all gas pilot lights and oil supplies.

3 Protect and survive

What you have read so far tells you how to prepare to face a nuclear explosion.
What follows tells you how to use the protection you have provided.

First - Know the Warning Sounds:

THE ATTACK WARNING

When an air attack is expected the sirens will sound a rising and falling note.
The warning will also be broadcast on the radio.

THE FALL-OUT WARNING

When there is danger from fall-out you will hear three loud bangs or three whistles in quick succession.

THE ALL-CLEAR

When the immediate danger from both air attack and fall-out has passed, the sirens will sound a steady note.

What to do on hearing an Attack Warning:

At home

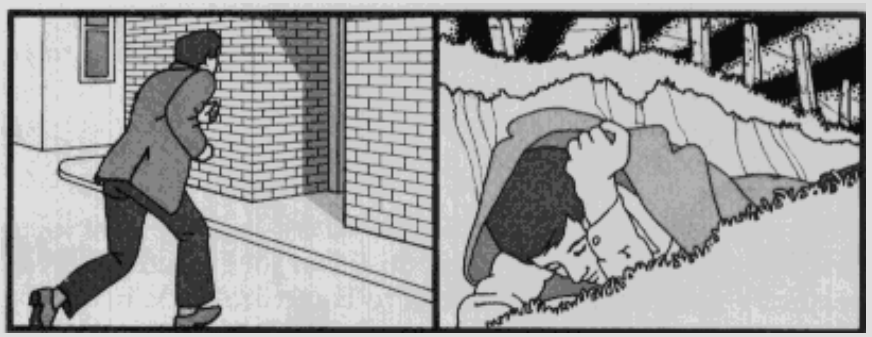
If you are at home you should:
Send the children to the fall-out room.
Turn off the gas and electricity at the mains; turn off all pilot lights. Turn off oil supplies.
Close stoves, damp down fires.
Shut windows, draw curtains.
Go to the fall-out room.

At work or elsewhere

If you can reach home in a couple of minutes try to do so.
If your are at work, or elsewhere, and cannot reach home within a couple of minutes, take cover where you are or in any nearby building.

In the open

If you are in the open and cannot get home within a couple of minutes, go immediately to the nearest building. If there is no building nearby and you cannot reach one within a couple of minutes, use any kind of cover, or lie flat (in a ditch) and cover the exposed skin of the head and hands.



Light and heat from an explosion will last for up to twenty seconds, but blast waves may take up to a minute to reach you. If after ten minutes there has been no blast wave, take cover in the nearest building.

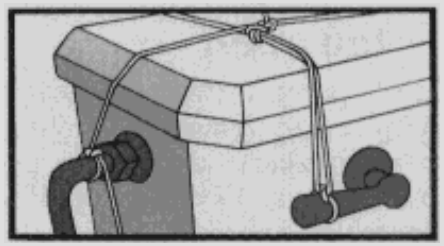
What to do after the Attack:

After a nuclear attack, there will be a short period before fall-out starts to descend. Use this time to do essential tasks. This is what you should do.

Do not smoke.
Check that gas, electricity and other fuel supplies and all pilot lights *are* turned off.
Go round the house and put out any small fires using mains water if you can.
If anyone's clothing catches fire, lay them on the floor and roll them in a blanket, rug or thick coat.

If the mains water is still available also replenish water reserves. Then turn off at mains.

Do not flush lavatories, but store the clean water they contain by taping up the handles or removing the chains



If the water supply is interrupted extinguish water heaters and boilers (including hearth fires with back boilers). Turn off all taps.

Check that you have got your survival kit at hand for the fall-out room. (See the list of survival items.)

If there is structural damage from the attack you may have some time before a fall-out warning to do minor jobs to keep out the weather using curtains or sheets to cover broken windows or holes.

If there is time, help neighbours in need, but listen for the fall-out warning and be ready to return to the fall-out room.

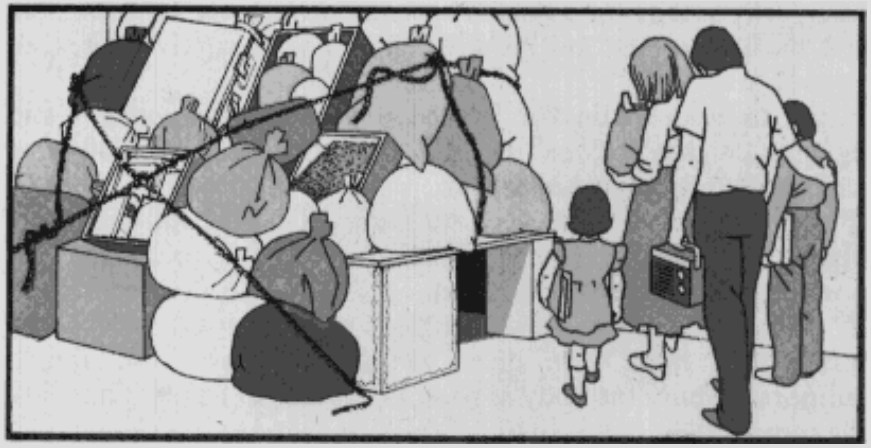
What to do on hearing the Fall-out Warning:

(Remember you may bear a fall-out warning without hearing an explosion.)

In the open

If you are out of doors, take the nearest and best available cover as quickly as possible, wiping all the dust you can from your skin and clothing at the entrance to the building in which you shelter.

At home



All at home must go to the fall-out room and stay inside the inner refuge, keeping the radio tuned for Government advice and instructions.

Stay in your refuge

The dangers will be so intense that you may all need to stay inside your inner refuge in the fall-out room for at least forty-eight hours. If you need to go to the lavatory, or to replenish food or water supplies, do not stay outside your refuge for a second longer than is necessary.
After forty-eight hours the danger from fall-out will lessen -but you could still be risking your life by exposure to it. The longer you spend in your refuge the better. Listen to your radio.
DO NOT GO OUTSIDE until the radio tells you it is safe to do so.

Later on

Visits outside the house may at first be limited to a few minutes for essential duties. These should be done by people over thirty where possible. They should avoid bringing dust into the house, keeping separate stout shoes or boots for outdoors if they can, and always wiping them.

Casualties

You may have casualties from an attack, which you will have to care for, perhaps for some days, without medical help. Be sure you have your first aid requirements in your survival kit. (See the list of survival items.)
Listen to your radio for information about the services and facilities as they become available and about the type of cases which are to be treated as urgent.
If a death occurs while you are confined to the fall-out room place the body in another room and cover it as securely as possible. Attach an identification.
You should receive radio instructions on what to do next. If no instructions have been given within five days, you should temporarily bury the body as soon as it is safe to go out, and mark the spot.

On hearing the ALL-CLEAR

This means there is no longer an *immediate* danger from air attack and fall-out and you may resume normal activities.

4 Your action check list

Here is a check list, which reminds you of the actions you must take to provide the protection outlined in this booklet.
Use the check list systematically, ticking off each item as you deal with it. This will help you to remember all the things you must do.

Action Before Attack	Tick When Completed
Warning Sounds	
1. Do you know the warning sounds?	☐
2. Do you know what action you must take when you hear each warning?	☐
Fall-out Room	
3. Have you chosen your fall-out room?	☐
4. Have you blocked up the windows and other openings (e.g. vents, chimney) of your fall-out room?	☐
5. Have you strengthened the outside walls and the floor above your fall-out room?	☐
Inner Refuge	
6. Have you made your inner refuge, inside the fall-out room?	☐
7. Have you strengthened it with dense materials?	☐

Survival Kit

8. Have you put the following items in your fall-out room?	☐
a) enough water, in sealed or covered containers, to last you and your family for 14 days?	☐
b) enough food to last you and your family for 14 days, including tinned or powdered milk for the children, and food for the baby - and a closed cupboard or cabinet in which to store these supplies?	☐
c) a portable radio (two if possible) and spare batteries?	☐
d) a tin opener, bottle opener, cutlery, crockery and cooking utensils?	☐
e) warm clothing and changes of clothing?	☐
f) bedding?	☐
g) a portable stove and fuel for it?	☐
h) torches, with spare bulbs and batteries, candles and matches?	☐
j) table and chairs?	☐
k) toilet articles?	☐
l) first aid kit?	☐
m) notebook and pencils?	☐

n) cleaning materials, including cloths, tissues, brushes, shovels and a box of dry sand?	☐
o) improvised lavatory seat, polythene buckets fitted with covers, polythene bag linings, for emptying the containers, strong disinfectant and toilet paper?	☐
p) a clock and calendar?	☐
9. Have you made arrangements to cover your extra water supplies in the bath, sink and wash-basin?	☐
Sanitation	
10. Have you put the following just outside the fall-out room?	☐
a) a dustbin for temporary storage of waste matter?	☐
b) a second dustbin for food remains, empty tins and other rubbish?	☐
Fire Precautions	
11. Have you painted all windows that are not blocked up?	☐
12. Have you got rid of all old papers and other junk that can catch fire easily?	☐
13. Have you taken down the net curtains?	☐
14. Have you got buckets of water ready on each floor?	☐
15. It you have a fire extinguisher, is it ready and in working order?	☐
Action on Attack Warning	
16. Have you sent the children to the fall-out room?	☐

17. Have you turned off the gas and electricity at the mains?	☐
18. Have you turned off all pilot lights and oil supplies?	☐
19. Have you closed the stoves and damped down fires?	☐
20. Have you shut all the windows and drawn the curtains?	☐
21. Have you filled the bath, sink and wash-basin with water, and covered them?	☐
22. Have you remembered to push in any aerial on your radio?	☐

Action After Attack

23. Have you checked that the gas and electricity are turned off at the mains, and that all pilot lights and oil supplies are turned off?	☐
24. Have you checked that any small fires in any part of the house have been put out?	☐
25. Have you replenished your water supplies?	☐
26. Have you taped up the handle, or removed the chain, from the lavatory?	☐
27. Have you turned off the water supply at the mains?	☐
28. Have you checked your survival kit?	☐
29. Have you done any minor repairs, to keep out the weather?	☐

REMEMBER:

The danger from fall-out is greatest in the first forty-eight hours. During that time you must stay in the fall-out room and as far as possible within your inner refuge.
If you leave the room to dispose of waste or to replenish food or water supplies, do not stay outside it for a second longer than is necessary.

REMEMBER:

The longer you spend in your refuge and your fall-out room after a fall-out warning the less the danger to your lives.

REMEMBER:

To listen to your radio.

REMEMBER:

To conserve your stocks of water and of food, and to keep them sealed, covered or wrapped - and close the cupboard door.
Water means life. Re-use it for different purposes, using as little as necessary for cooking. Cans of food, pierced through the top, may be heated in a saucepan of water and the same water used several times without cleaning the pan.
Used utensils can be cleaned by holding or placing them in the same hot water.

REMEMBER:

Avoid waste.

REMEMBER:

To carry out your sanitation arrangements with care.
Keep separate containers for lavatory waste and for other rubbish.
Keep all containers covered.
Keep hands as clean as possible.

Remember the Warning Sounds

THE ATTACK WARNING

When an air attack is expected, the sirens will sound a rising and falling note.
The warning will also be broadcast on the radio.

THE FALL-OUT WARNING

When there is danger from fall-out you will hear three loud bangs or whistles in quick succession.

THE ALL CLEAR

When the immediate danger from both air attack and fall-out has passed. the sirens will sound a steady note.

Protect and survive

Keep this booklet handy

Further reading
A booklet, *Nuclear Weapons* (ISBN 0 II 340557 X), published by Her Majesty's Stationery Office, is also available. It contains detailed information about the effects of nuclear weapons and will be of interest to those who wish to further their knowledge of the subject.

A leaflet, *Domestic Nuclear Shelters*, also published by Her Majesty's Stationery Office, is available. This includes advice on domestic shelters providing protection against nuclear explosions.

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