Telephone Installers Handbook

British TELECOM part of the Post Office

TELEPHONE INSTALLERS HANDBOOK

BRITISH TELECOM

ISSUE - 2

FOREWORD

These guide notes have been constructed to help installers in the sequence of operations to be followed when providing the external services of the telephone installations and is additional to the information contained within the relevant TI's. It does not necessarily cover every situation which may be met in practice but where the general principles underlying the methods should be borne in mind.

The safety of the installer and the public is paramount at all times. If there is any doubt about safety aspects on any job, ask for assistance. The range of work for installers is given in TI C4B0020.

INDEX

SECTION 1
The control

Contact your Control Officer – 1 if assistance is required.
2 when moving site location.

SECTION 2
Exchange and P. B.X. jumpering

Unless you have been asked to do this the Control Officer will have arranged for it to be put in hand before giving you the advice note.

If jumpering co-operation will be required during the progress of your job. (For example—shared service changes.) ADVISE THE JUMPERING OFFICER BEFORE you start the job so that he has time to do the jumper changes before you are ready to bring the circuit into service.

SECTION 3
Cabinet and pillar jumpering (where necessary)

YOUR INFORMATION

Mr ..... *A Survey Report (A895/A810) *An earth should be provided

Protectors should be fitted *Cabinet and Pillar jumpering is reqd

*The apparatus listed overleaf will be reqd. The Dgm Nos are ..... The Eng. allcn is .....

Signed..... Installation Control..... 197.....

M.D.F. Termination		Cabinet No.	Cabinet E Side	Cabinet D Side	Pillar No.	Pillar E Side	Pillar D Side	D.P. No.	D.P. Pair	Location of Tee, Job Type etc.

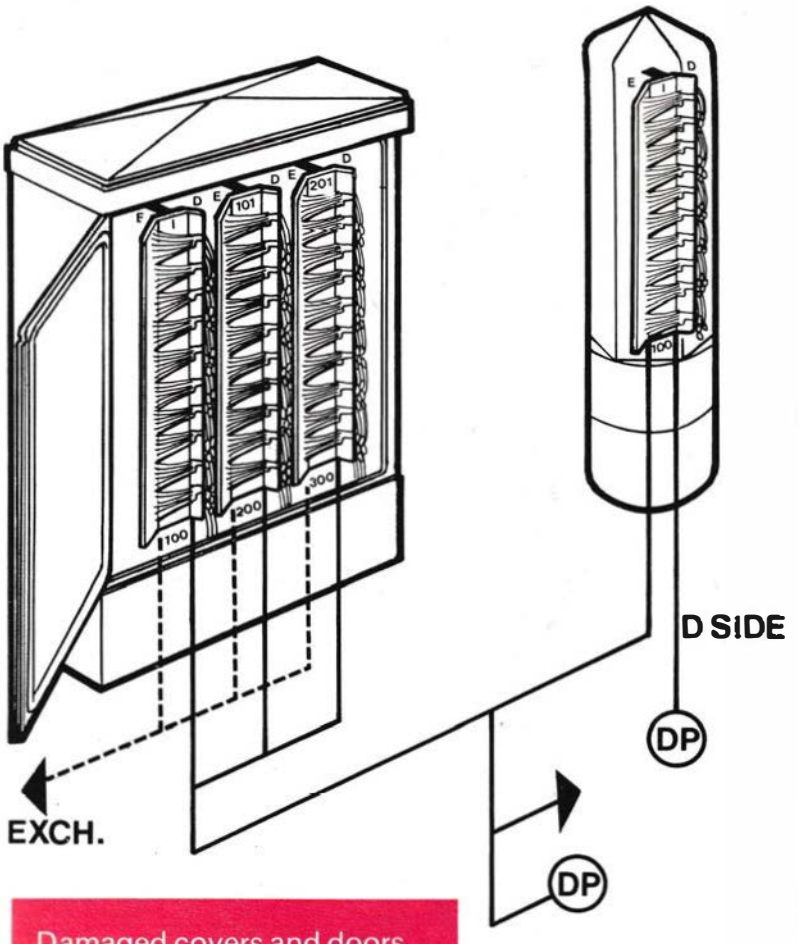
The Installation Control *The work has been completed *Certified A895/A810 attached

*A departure from the AN has been made A ..... attached The Dgm nos are .....

*Directories and Instruction Cards have been left and labels fitted *DP particulars are as shown

The stores used/recovered are listed overleaf

*delete as reqd Signed .....



1 Check that you get DIAL tone on the allotted E side pair. Prove that this is your circuit by dialling the number of the line that you are working on. You should get ENGAGED tone. Run the jumper neatly from the E to D side pairs shown on your AN.
If you make an error in your connections or a pair is faulty you will be unable to call from the next point.

2 NO DIAL TONE

Check with the jumpering officer that the line is jumpered and ready for service. If not, ask for it to be put in hand.

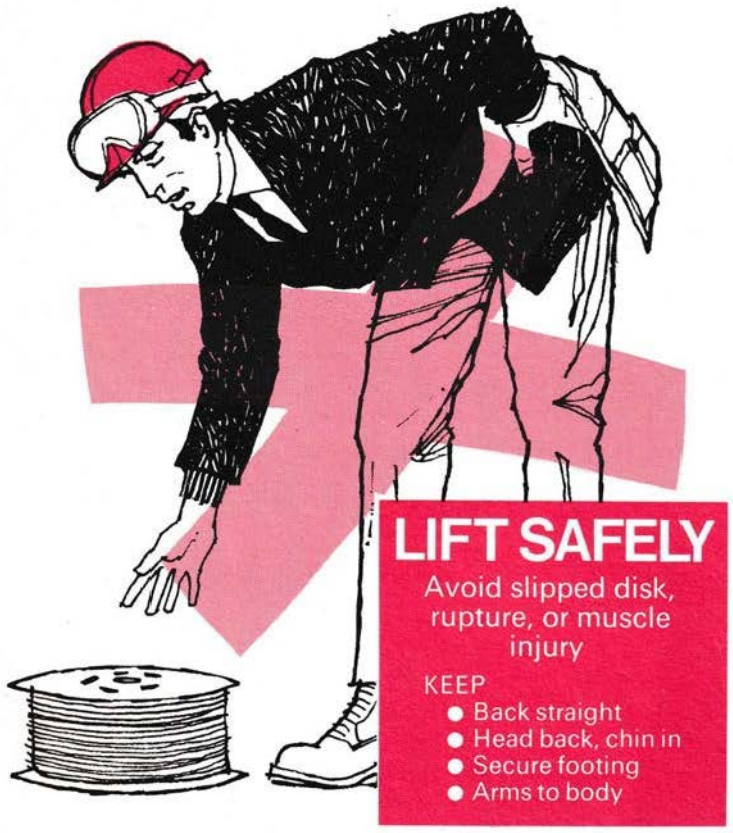
3 FAULTY PAIR
Ask for alternative routing from the R and R duty. Advise the jumpering officer if the exchange jumper has to be shifted.
If several alternative pairs have been given and tried make sure that the final routing particulars are clearly indicated in the appropriate box on the advice note.

Damaged covers and doors mean danger. Report them.

Place stores and Tool Bass so that they will not obstruct.

CHECK THE DESICANT PACKS

USE THE CORRECT JUMPER WIRE



LIFT SAFELY

Avoid slipped disk, rupture, or muscle injury

KEEP

- Back straight
- Head back, chin in
- Secure footing
- Arms to body

BE SAFE!

Keep tools in good trim

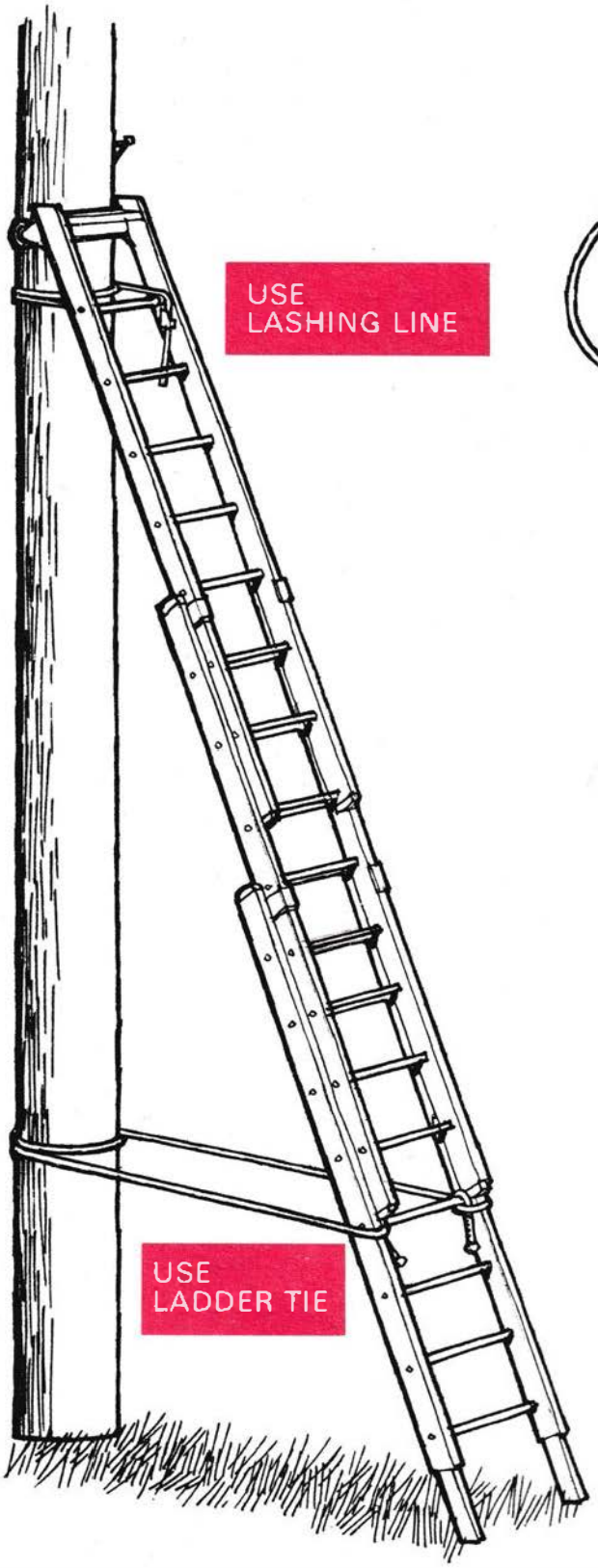
BE SAFE!

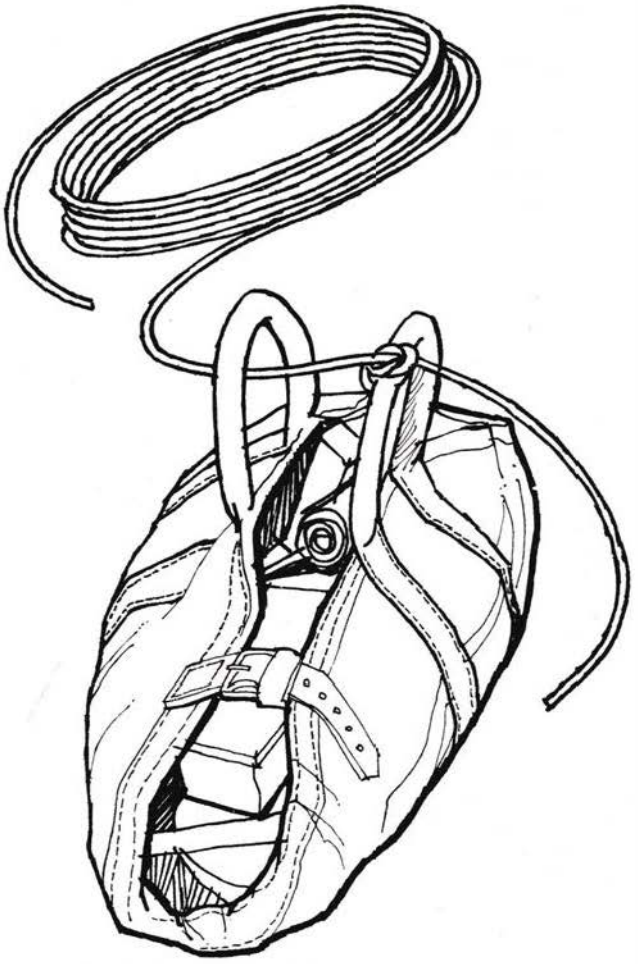
These items are available for your personal safety

REFERENCE TIM4E0599

Safety first

Pole work special items





TOOL BASS LINE
(12m Line sash No 2)

Always erect ladder with 4:1 slope.
Always secure at top and bottom.

REFERENCE TIM4E0600

SECTION 5
Dropwire dispenser techniques

GENERAL REFERENCE

1 This section is intended to be used as a reference manual for the Dropwire Dispenser. Full details of the method to be used are described in Telecommunications Instruction C2A 1002 an extraction from this Instruction regarding organisation is reproduced below.

2 Equipment:- The following items are required to carry out the method described
   a. A long sashline (66 m of Line Sash No. 2).
   b. A medium sashline (44 m of Line Sash No. 2).
   c. A short sashline (22 m of Line Sash No. 2).
   d. Dropwire Dispenser, including three pulleys dropwire.
   e. Pole belts.
   f. Sashline dispenser.

   together with the necessary Cones, Road signs and ladder ties.

3 Limitations in the use of one-man installers. Though suitable jobs can normally be identified by Routing and Record officers, the final decision on whether the job can be done single-handed MUST rest entirely with the installer. Other than the qualifications set out in Telecommunications Instruction C2A 1002 which limits the ability of the one-man installer to undertake work applicable to the use of the dispenser (see below), the work of the one-man installer must be limited to three spans (including the span to the house) and to only one road crossing. When inspecting the job, the installer must take account of the standard safety regulations as laid down in the Safety Guide Rg 41 and the Road Work Guarding Manual and where the job cannot be completed safely by one man he should report the fact to his Control Officer. Typical examples of where the job cannot be done single-handed within the safety regulations are:-
   a. where the ladder footing is insecure and lashing is impracticable,
   b. where the ladder issued to the installer (i.e. No. 4A, 5 or 5M) is not adequate for the work in hand,
   c. where the dropwire must be erected over a road and there is insufficient visibility or where traffic is too heavy to allow the methods to be used safely,
   d. where more than 3 spans (including the span to the house) of Dropwire No. 6 are required,
   e. where Dropwire No. 4 is required.

4 In such circumstances the Control Officer will arrange assistance while the installer is on site. If this is not possible the work should be undertaken later by an appropriate party. Under no circumstances will the work be withdrawn from one-man installer and given to another later. If circumstances are such that a one-man installer cannot complete the work, that part of the work which he can do single handed, including proving the pair to the DP, lead-in and internal work, should be completed prior to leaving the site.

THINK SAFETY

SECTION 6
Arrival at premises

Do not cause undue obstruction to other road users. Use cones and road signs when necessary.

1 Park vehicle near-side to kerb and close to serving pole if possible.

2 Determine location of telephone and lead-in.

3 Complete a card A108, and leave at subscriber's premises. Ensure that your entries are legible. Proceed to next job.
— Advise control.

SECTION 7
METHOD 1 No road crossing

1 Survey route of span, attachment point, cable run etc. Check ladder footing.

2 Display road signs as and where appropriate.

3 Take tool bass with brackets, clamps etc. and ladder to house.

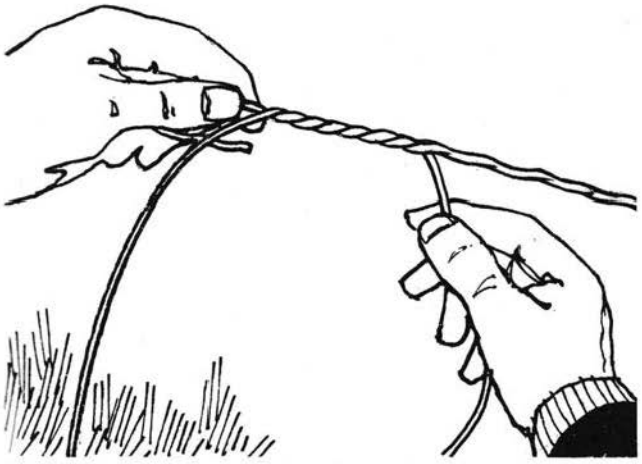
4 Return to vehicle for dropwire dispenser (and stores and tools for external earth if required).

Erect ladder with 4 :1 slope and check footing.

5 Erect ladder.

Place dropwire dispenser so that it does not obstruct.

6 Pay off enough dropwire to reach bracket point and for lead-in.



7 Attach clamp to dropwire at estimated position of bracket.

8 Attach dropwire clamp on to handle of tool bass.

9 Double free end of bass line and tuck under belt so that it will be pulled out easily should it become tensioned while the ladder is being climbed.

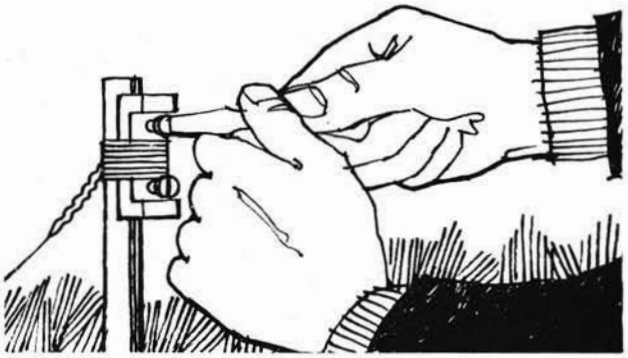
Climb with hands unimpeded at all times.

10 Ascend ladder.

11 Pull up tool bass and secure to ladder.

12 Fix bracket attach dropwire.

13 Run dropwire to lead-in point resiting ladder to maintain a comfortable working position.



14 Provide external earth if required. Run earth wire to lead-in point.

15 Carry ladder and tool bass to pole.

16 Test pole, inspect footing for ladder.

ALWAYS TEST POLE BEFORE CLIMBING

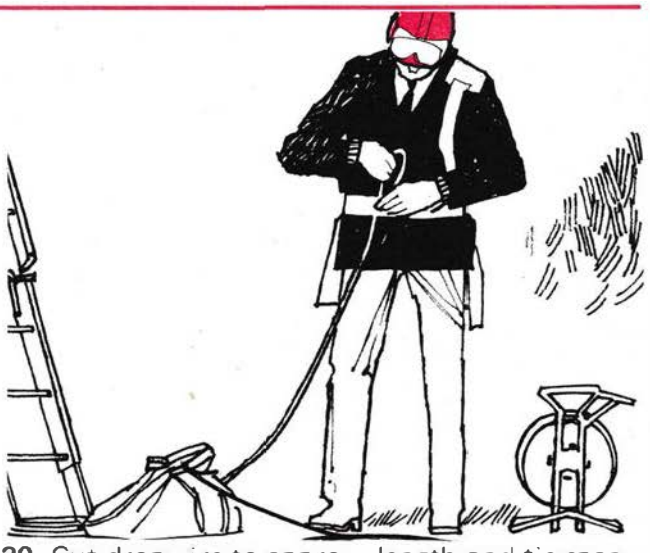
17 Collect, inspect and put on safety belt. Collect sash line.

Erect ladder with 4 :1 slope.

18 Erect ladder, and secure at foot.

Place dropwire dispenser so that it does not obstruct.

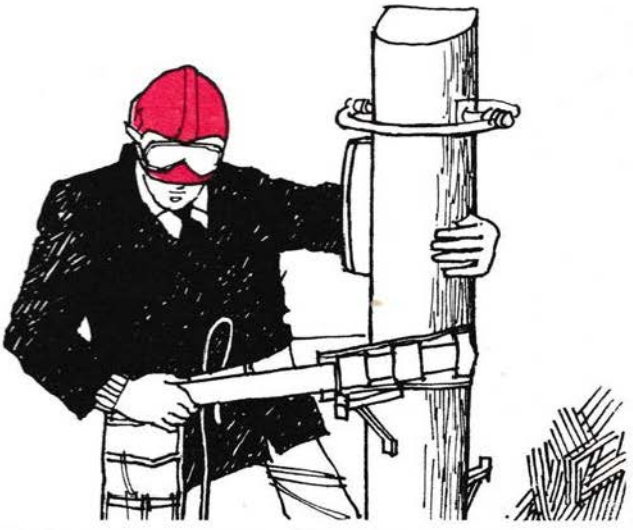
19 Pay out span to pole, keeping clear of minor obstructions. Rotate the dispenser a number of times to introduce twists into span.



20 Cut dropwire to approx. length and tie span to handle of tool bass. Tuck doubled end of bass line under belt.

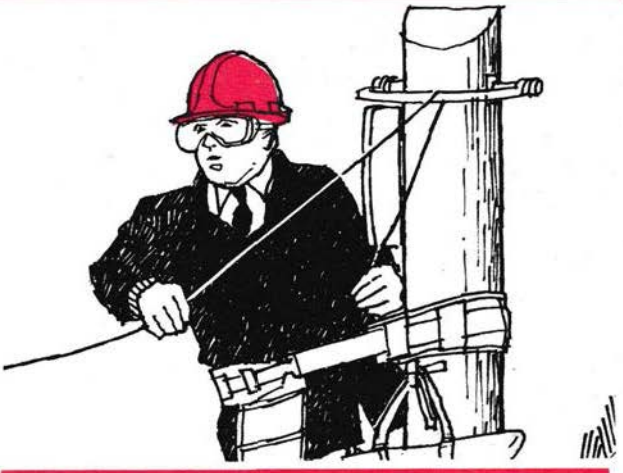
Climb with hands unimpeded at all times.

21 Ascend ladder. Lash top of ladder to pole if not done previously.



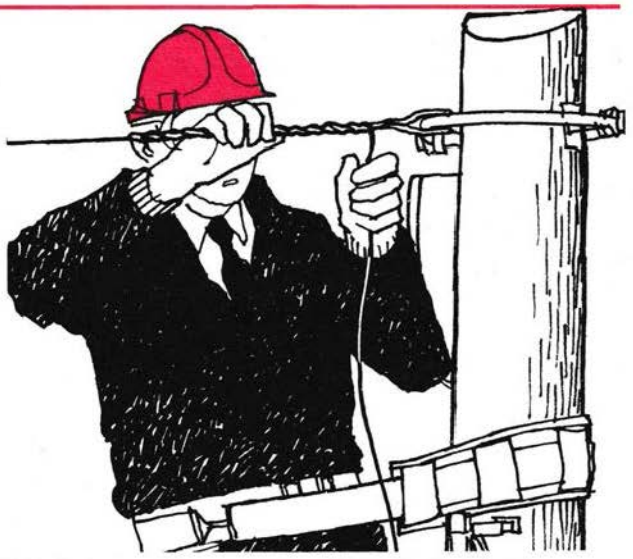
22 Ascend pole to working position and secure safety belt.

23 Pull up tool bass and dropwire. Secure bass to step provided.

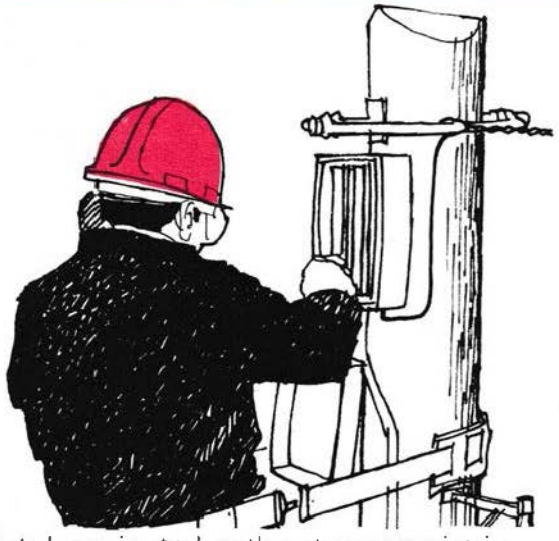


24 Pull up slack in dropwire. Secure temporarily.

25 Fit clamp.

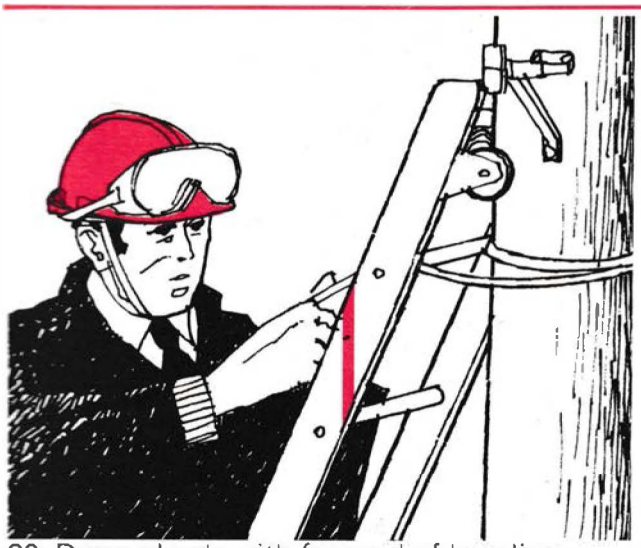


26 Tension dropwire and secure in clamp.



27 Cut dropwire to length put excess wire in tool bass.or belts pocket. Check allocated pair with handset and terminate dropwire.

28 Replace BT cover and fix correctly. Lower tool bass using bass line.



29 Descend pole with free end of bass line tucked under belt. Unlash top of ladder in passing.

30 Take down ladder. Return to vehicle with tool bass etc.

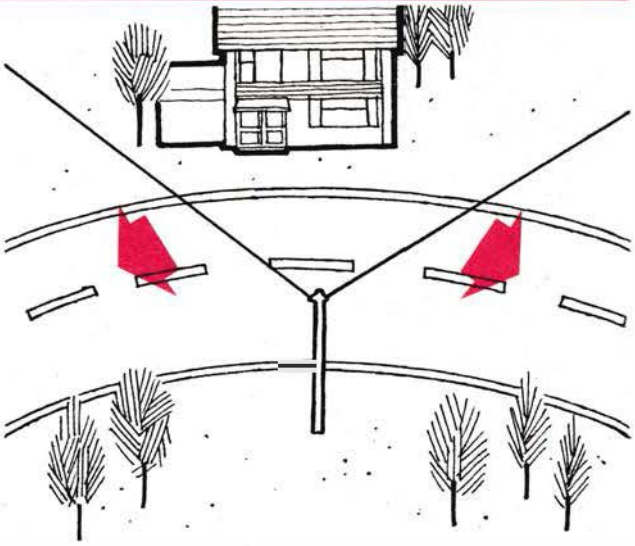
Always secure ladder at top and bottom.

Get a comfortable working position and avoid stretching.

SECTION 8

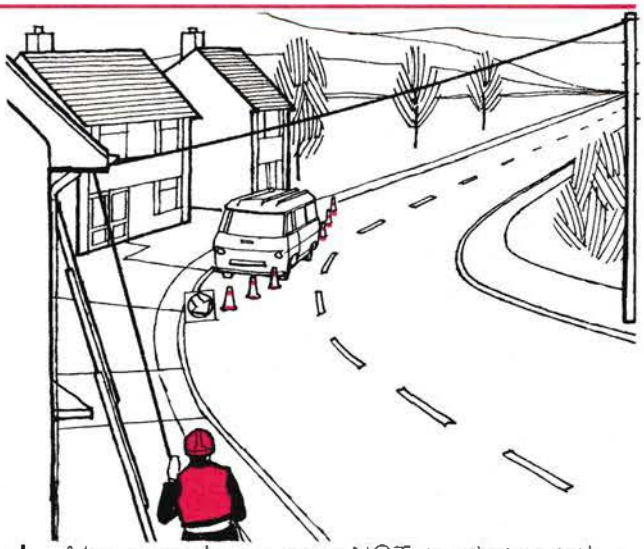
Road crossings – Deciding on the pulling up position

a. Better view of road from pole. Therefore dispenser at house (Method 2).



b. Better view of road from house. Therefore dispenser at pole (Method 3).

c. Remember you can always move out from pole or house to obtain better view of road.



d. Always park van so as NOT to obstruct the view from pulling up position, make full use of cones, road signs etc.

Do not cause undue obstruction to other road users.

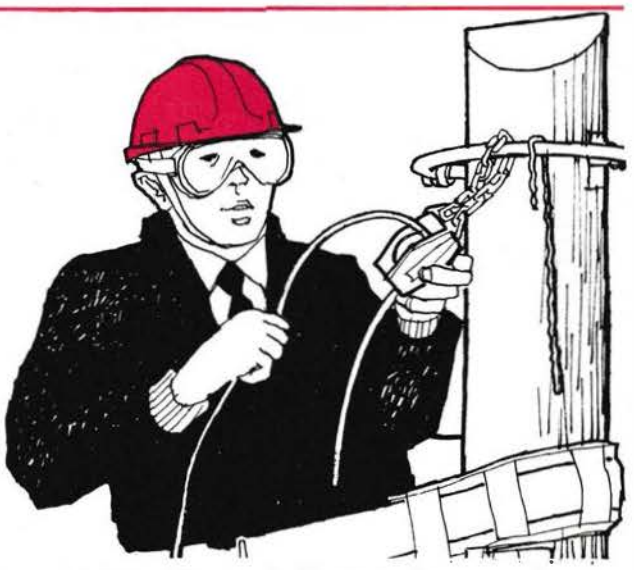
IF IN DOUBT – SHOUT OUT – FOR ASSISTANCE

METHOD 2 Road crossing
Pulling up position pole end

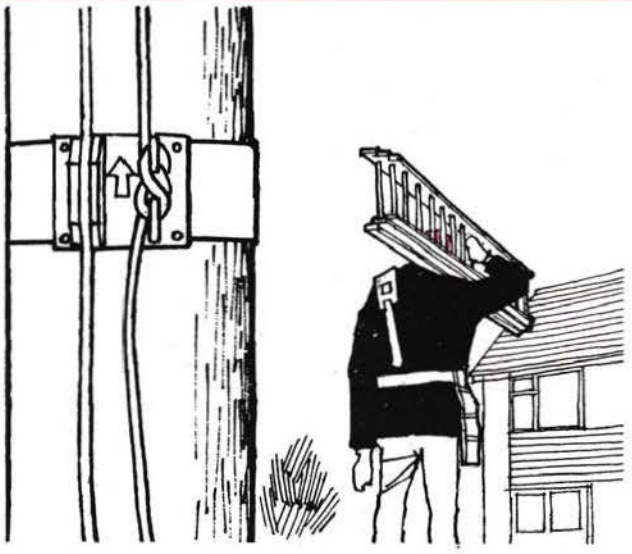
1 Determine location of telephone and lead-in.

2 Take ladder and short sashline to pole.

3 Test pole, erect ladder lashing at bottom and top.



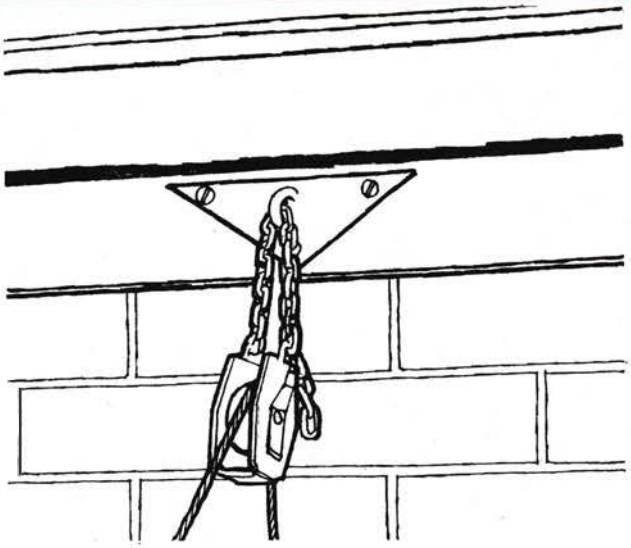
4 Secure safety belt. Place pulley on pole fitting and suspend short sashline.



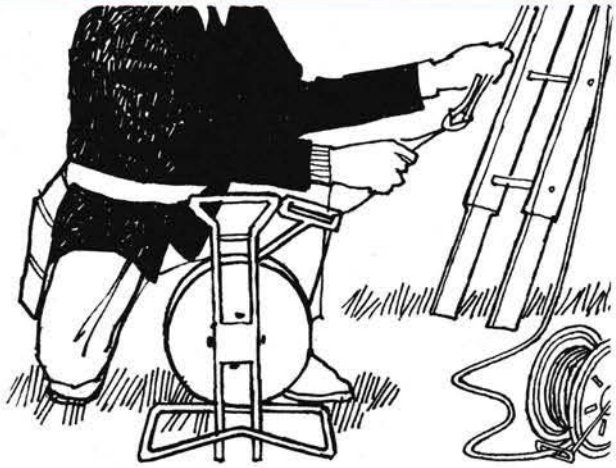
5 Secure sashline at foot of pole, return to house end.

6 Collect dispenser and tools.

7 Fit bracket, attach pulley and suspend long line .....



8 .....with the short end on the house side of pulley.



9 Connect short-end of line to the dropwire close to the drum, ensure sufficient tension is on dispenser.

10 Lay out sashline .....

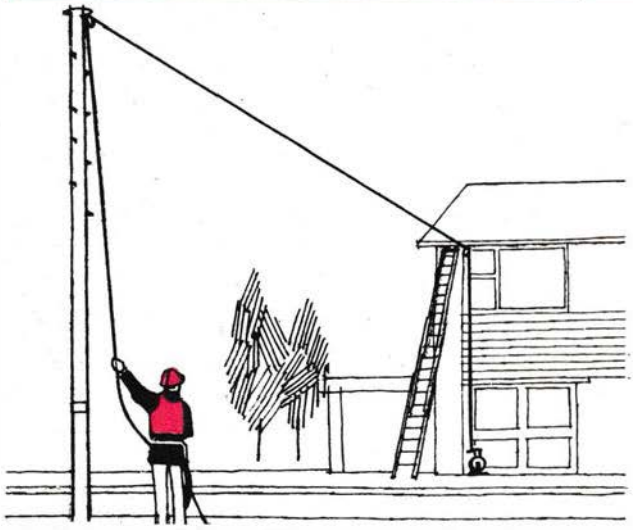
11 .....when clear cross road.

12 .....ensure rope is flat on road to allow traffic to pass over safely.

DO NOT WALK BACKWARDS OVER ROAD

13 .....remove long-line from sashline dispenser and tie suspended short line to long line.

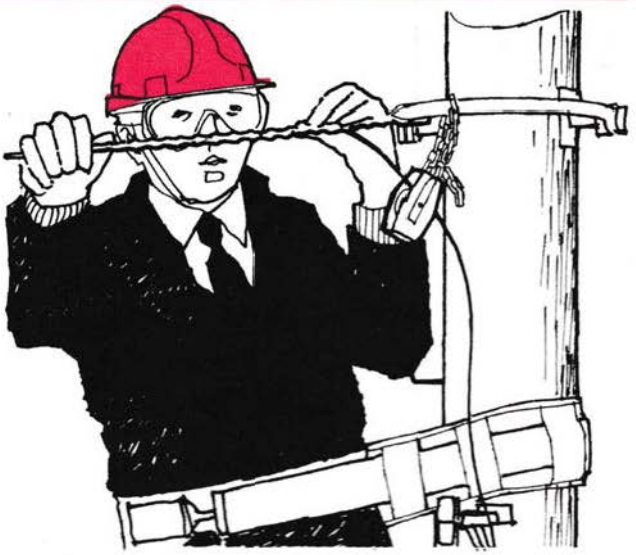
14 Pull up slack – keeping foot on rope laid over the road until ready to pull up. Check if road is clear of traffic.



15 Pull up sashline with steady pull and continue to pull over until sufficient dropwire has passed the serving pole.

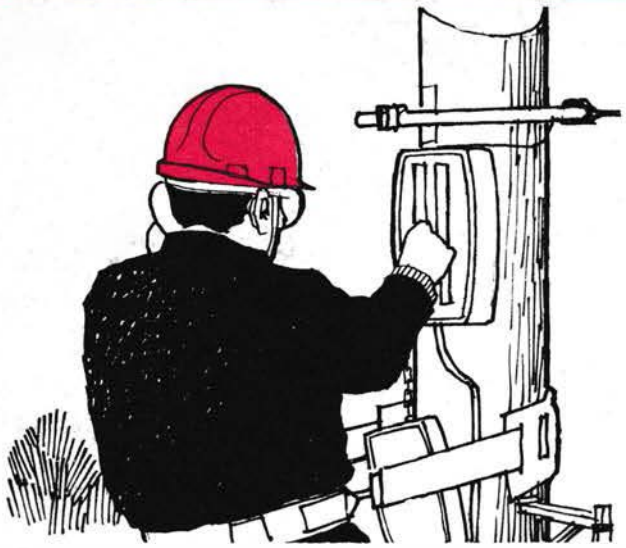
16 Secure sashline in pole belt maintaining the tension in span, keep rope tidy on the footpath .....

17 .....return to house end and complete lead-in.



18 Final tension applied at pole end.

BE READY IN CASE THE LINE BREAKS



19 Pick up pair and terminate dropwire on block terminal.

Check for pedestrians or vehicles etc. before pulling up sashline.

NOTE
Pulling the dropwire over the pulley automatically inserts twists into the span.

KEEP ROPE UNDER FULL CONTROL ALL THE TIME

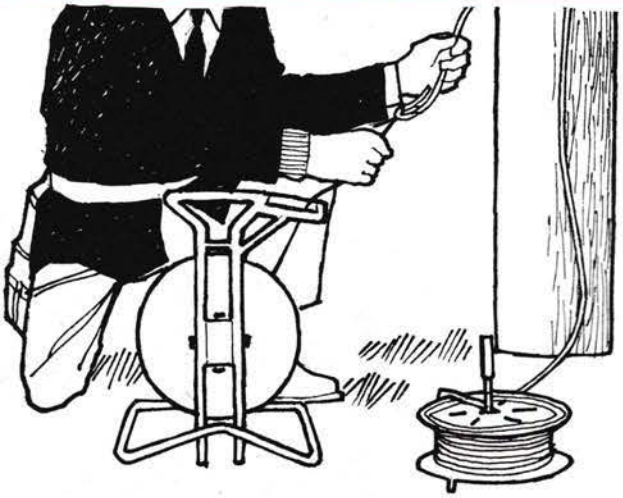
METHOD 3 Road crossing
Pulling up position at house end

1 Determine location of telephone and lead-in.

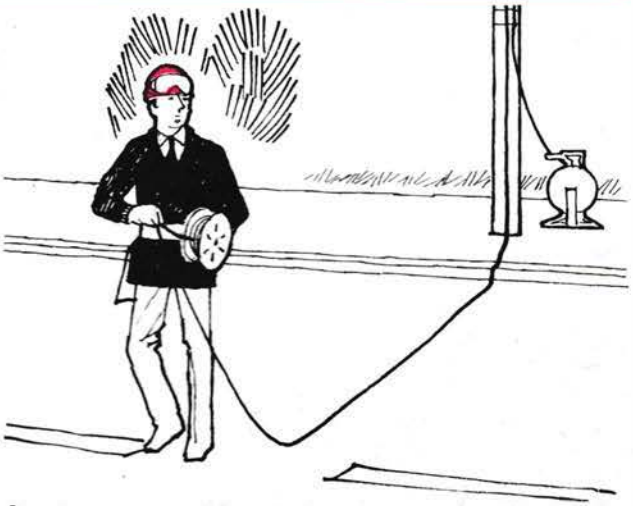
2 Take ladder, **long** sashline, pulley and belt to pole.

3 Test pole, lash ladder, suspend **long** sashline from pulley on pole fitting and secure at foot of pole.

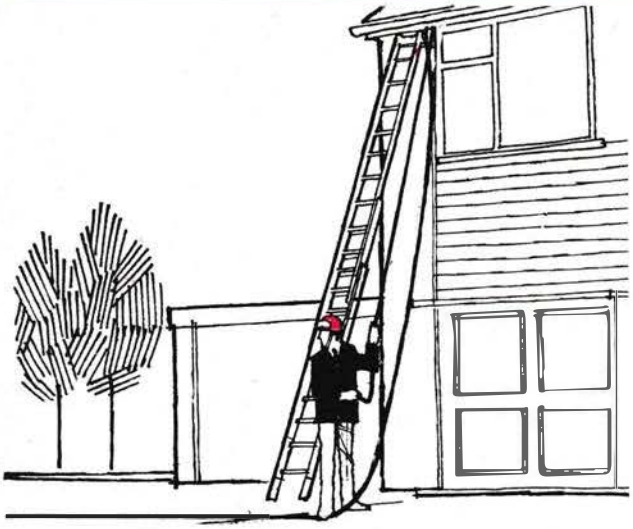
4 Take ladder to house end, fit bracket, suspend pulley and short sashline.



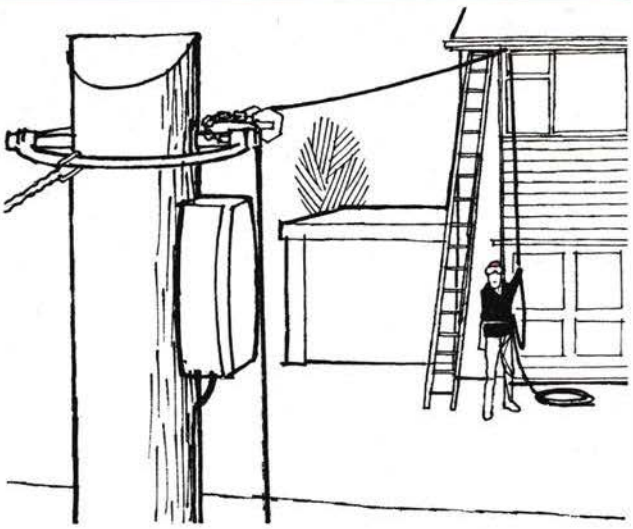
5 Take dispenser to pole and secure short end of long sashline to dropwire.



6 Lay out sashline to house ensuring that it lies flat on the road. Secure running end of sashline in clam cleat to keep rope under control during windy conditions.



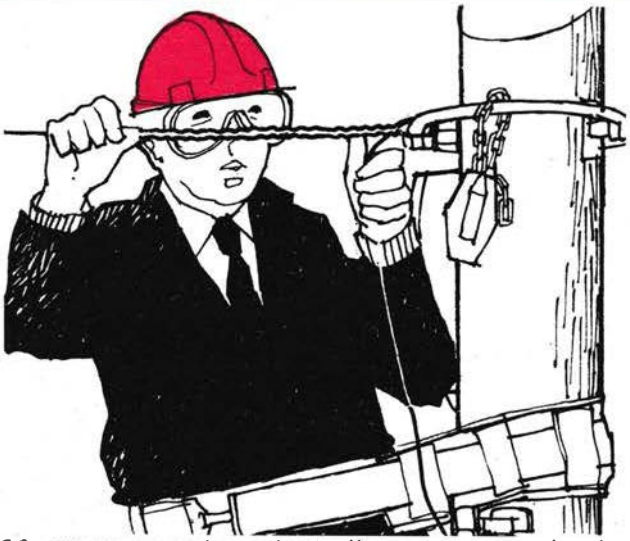
7 At house secure to short sashline and prepare to pull up when road is clear.



8 Pull up rope and erect dropwire pulling over sufficient for lead in. Secure at house end .....

9 return to Dispenser and lock drum keeping dropwire under tension .....

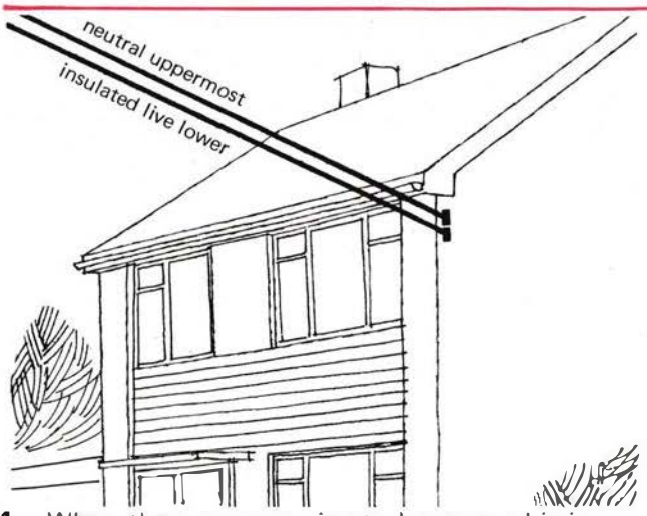
10 complete lead-in.



11 return to pole, unlock dispenser, ascend pole and apply final tension, fit clamp and complete termination.

REMEMBER TO RECOVER THE PULLEYS

METHOD 4 No road crossing
Crossing over L.V. power service wires to houses

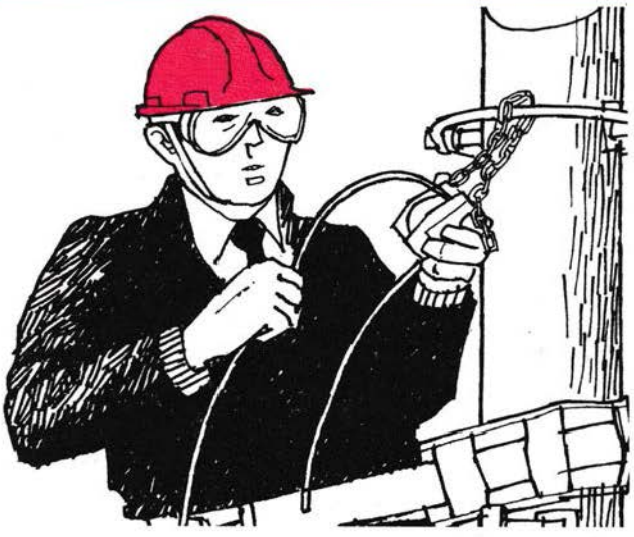


1 When the power service to be crossed is in verticle formation with the neutral uppermost and the live conductor is insulated the following method may be used.

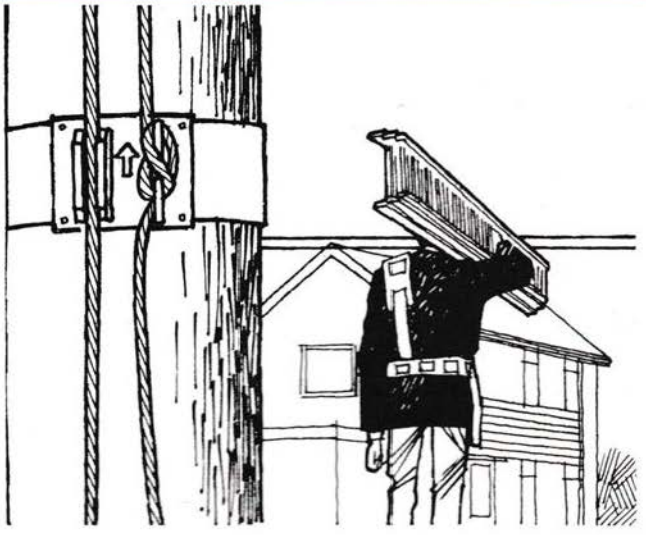
2 Determine location of telephone and lead-in.

3 Take ladder, short sashline, pulley and belt to pole.

4 Test pole, erect ladder lashing at bottom and top.



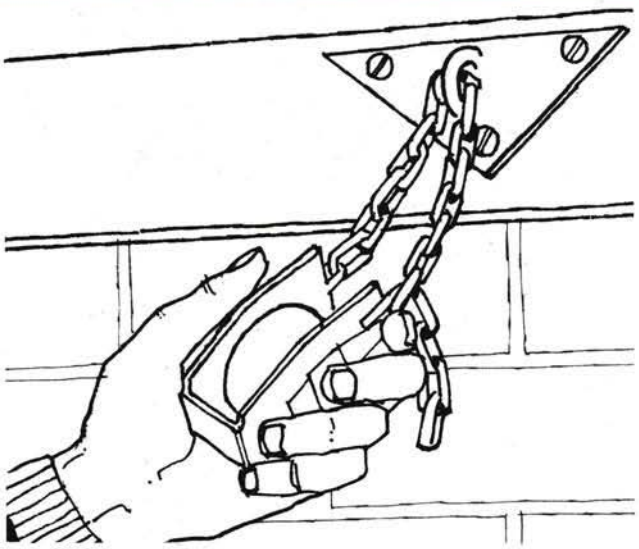
5 Ascend, secure safety belt. Place pulley on pole fitting and suspend short sashline.



6 Secure sashline at foot of pole and return to house end.

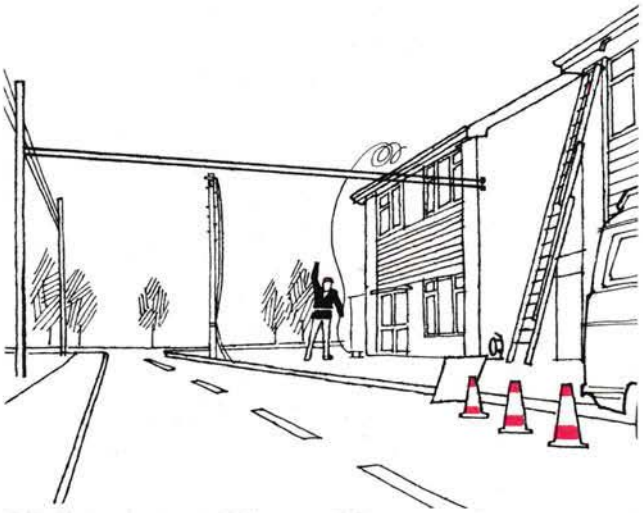
ALWAYS TEST POLES BEFORE CLIMBING

7 Fit bracket .....



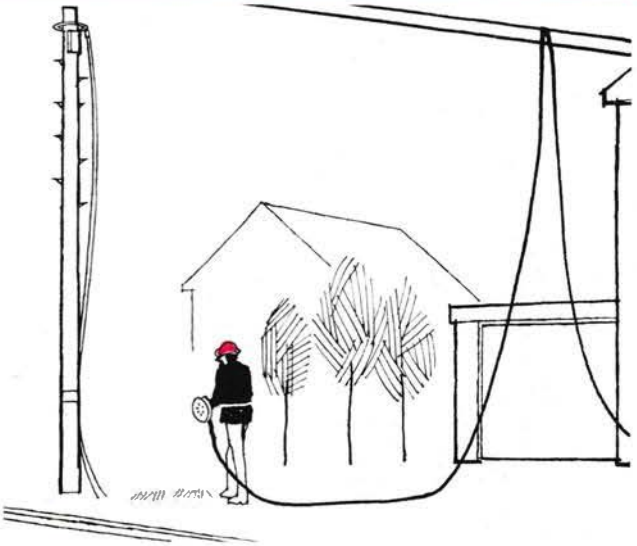
8 .....attach pulley

9 .....collect dispenser.

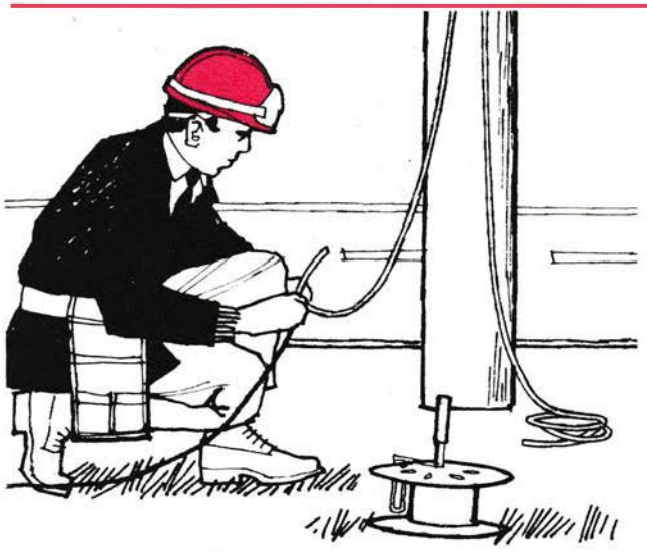


10 Take long sashline and throw end over power wires ensuring that the end does not go on to carriageway.

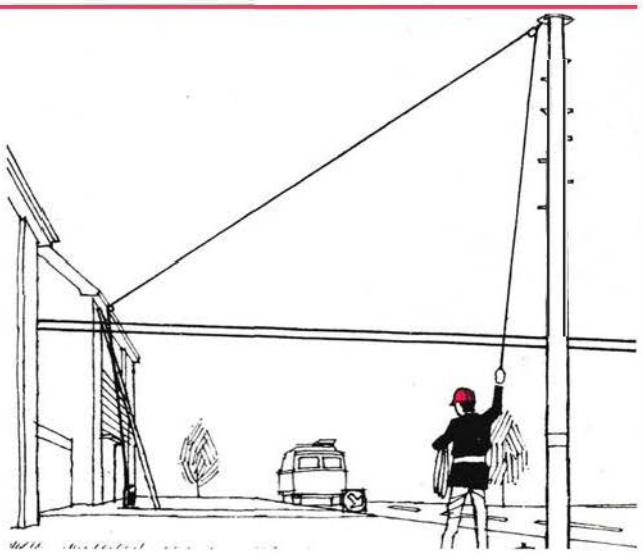
11 Place end through pulley and tie off onto dropwire close to drum



12 .....run out sashline to D.P.



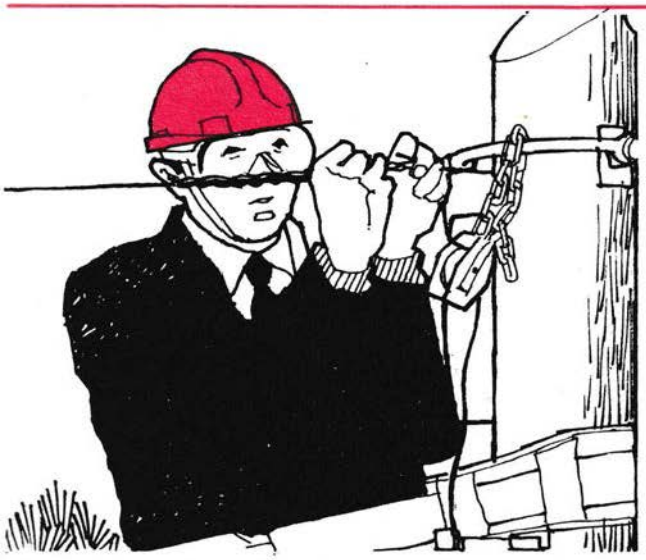
13 Remove long line from sashline dispenser and tie to suspended short sashline.



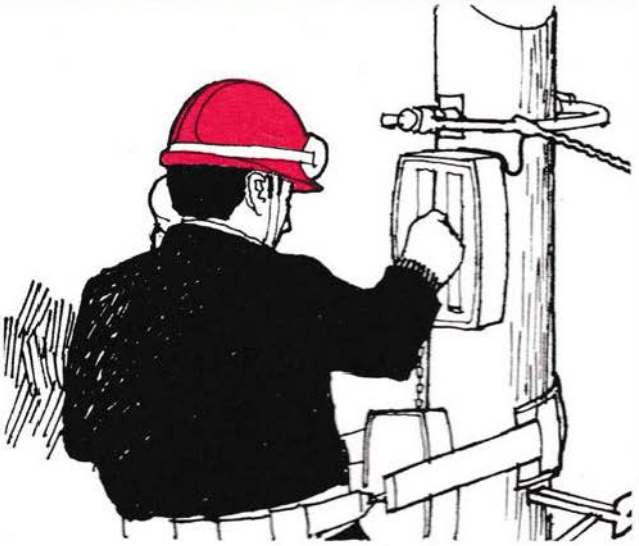
14 Pull up sashline with steady pull and continue to pull over dropwire.

15 Secure sashline at foot of pole maintaining the tension in span — keep sashline tidy.

16 .....return to house end and complete lead-in.



17 Apply final tension at pole end.



18 Pick up pair and terminate dropwire on block terminal.Replace BT cover.

ERECT LADDER WITH 4:1 SLOPE – CHECK FOOTING

Climb with hands unimpeded at all times.

NOTE

1. Where Post Office lines cross over services, power lines that are "on the flat" or that are in vertical formation with the insulated live uppermost, dropwire No. 4 or No. 6 **must** be used.
2. The neutral conductor of a main power line can be indentified because it is the conductor to which all the neutrals of the service spurs are connected. (TI A2 E 3001)

NOTE:
JOINT USER POLES

Separating distances :-

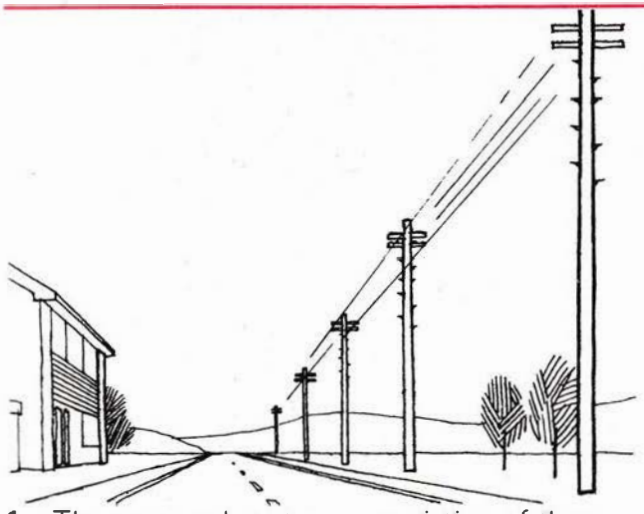
1 Power lines – Low voltage between 0.55m and 1.8m Refer TIA2E3002

2 Power lines – Medium voltage is 1.2m Refer TIA2E3001

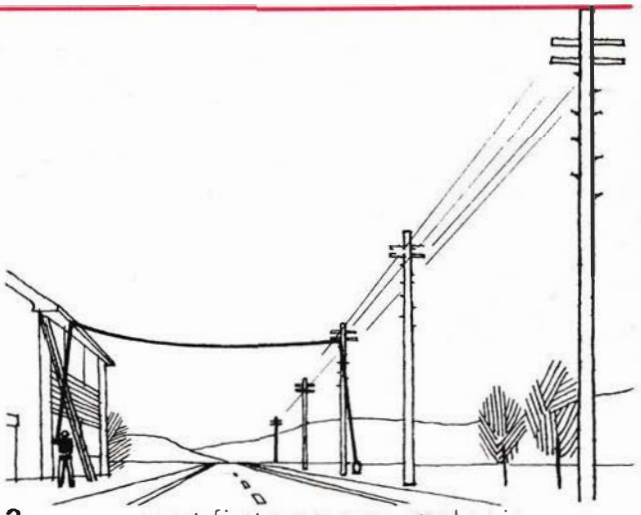
3 Power lines – High voltage is 2m Refer TIA2E 3502

KEEP ROPE FLAT AND PULL UP SMOOTHLY AND QUICKLY

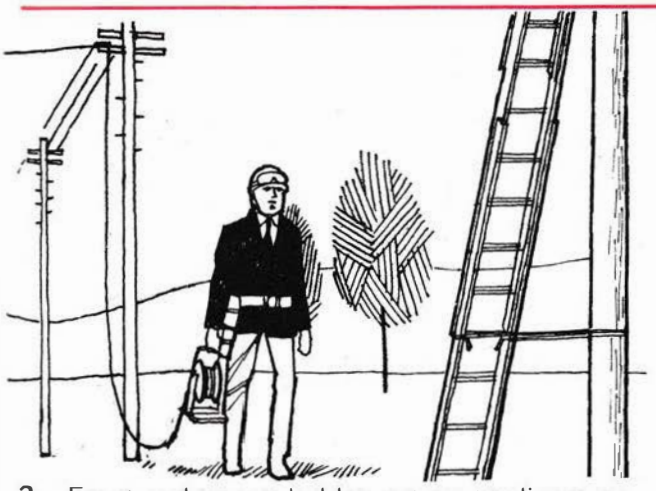
METHOD 5 Multi span jobs
Pulling up position at house end



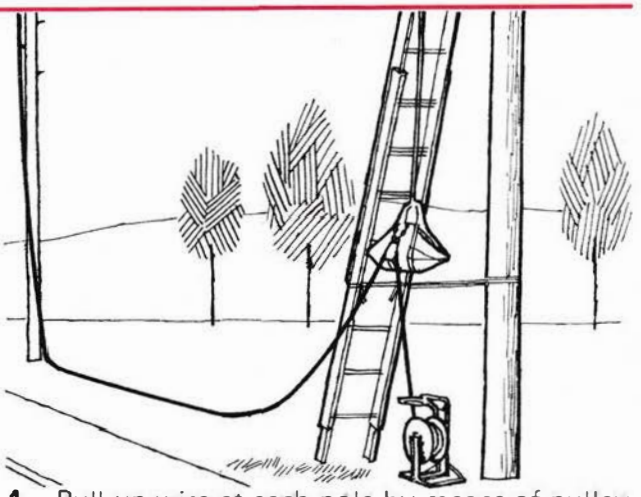
1 The proposed route ..... consisting of three spans including the drop off to subscriber.



2 .....erect first span over road as in METHOD 3, dispenser at foot of pole, secure span over the road with clamp. Take ladder to next pole.



3 Erect and secure ladder, return to dispenser. Rotate dispenser a number of times to insert necessary twists into the span. Slacken off Tensioning device and walk back to D.P. with Dispenser erecting one span at a time.



4 Pull up wire at each pole by means of pulley secured to tool bass handle ..... erect each span in similar manner.

NOTES

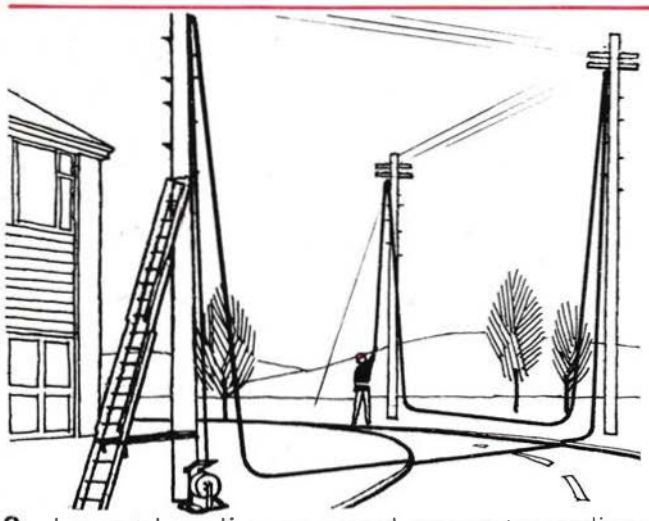
1 A Combination of METHOD 5 and 6 will cover most MULTI-SPAN situations e.g. Double span pull-up from house end can be done by METHOD 5 with dispenser initially placed on other side of road, completing the span by walking back with the dispenser to the Distribution Pole as in METHOD 5.

2 As the dropwire is not pulled over pulley when walking back with dispenser it is necessary to insert required twists into the span by rotating the dispenser a number of times (minimum of 5 per span).

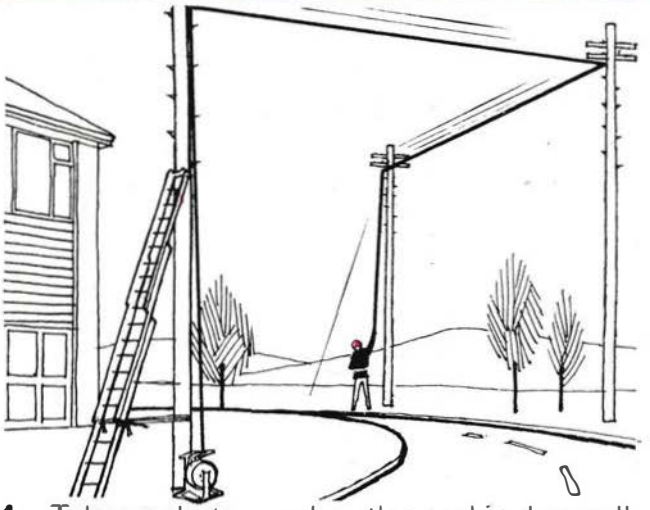
METHOD 6 Multi span jobs
Pulling up position at pole end

1 The proposed route – consisting of road crossing in the second span –

2 place dispenser at pole on far side of road from pulling up pole ..... prepare other poles with short and medium sashlines and pulleys



3 lay out long line over road, secure to medium sashline at centre pole, pull through slack, layout and secure to short sashline at final pole.



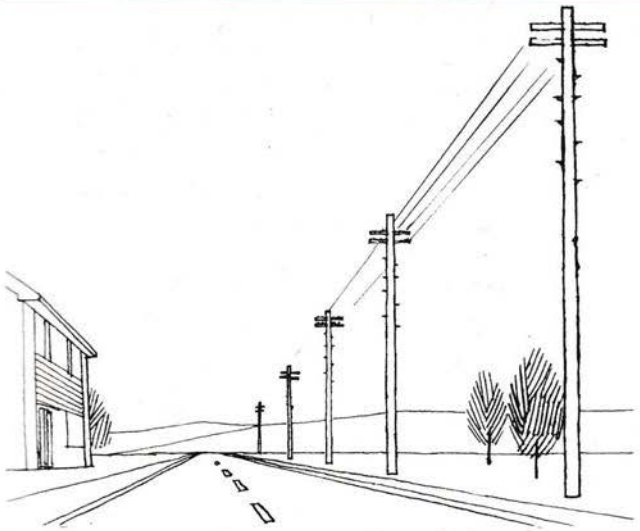
4 Take up slack ..... when the road is clear pull up both spans in one operation.

5 Secure line at pulling up position and return to dispenser position.

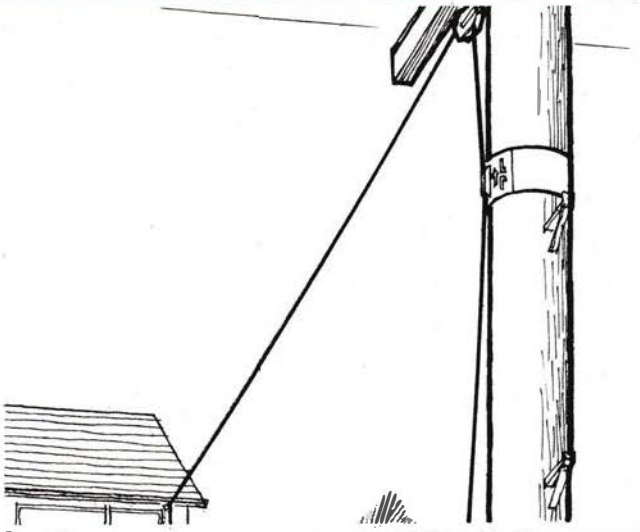
6 Secure dropwire at pole. Walk with dispenser to house and erect span, final tension from pole positions.

ALWAYS APPLY FINAL TENSION FROM POLE

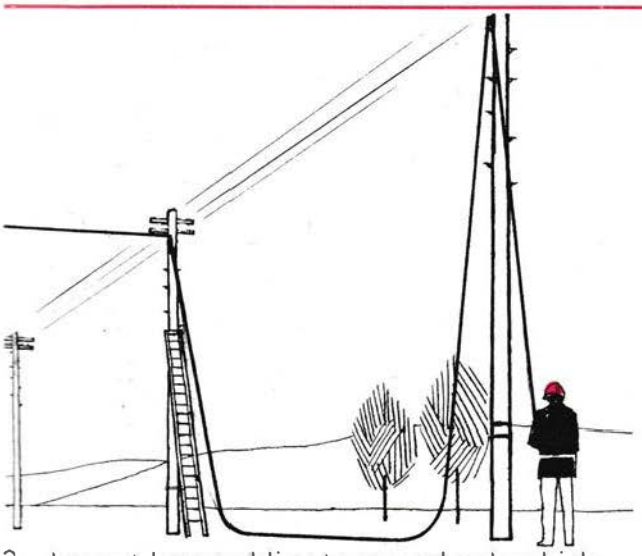
METHOD 7 Multi span jobs–(using pole belt)
Pulling up position at pole end



1 The proposed route consists of three spans including the drop off to the customers premises.

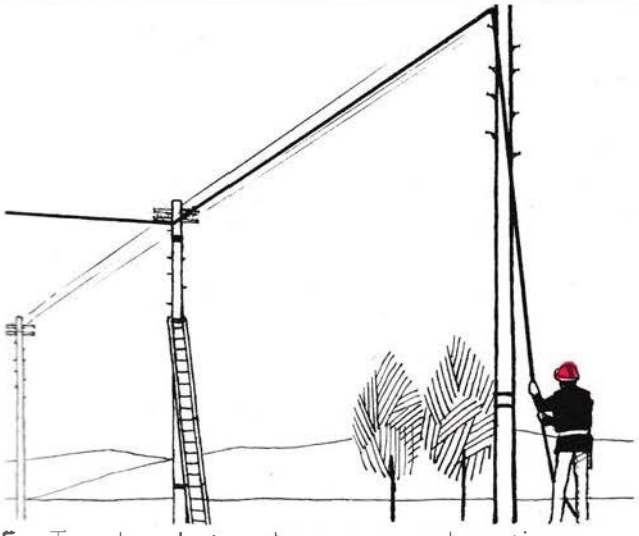


2 Erect span over road as in METHOD 2, secure rope in clam cleat on belt, having placed the belt at top of pole

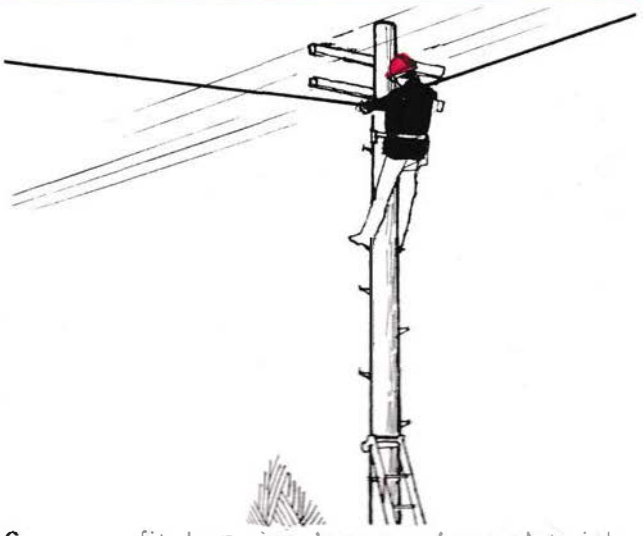


3 lay out long sashline to second pole which has been prepared with short sashline, pulley and pole belt.

4 Pull up sashline until tension is maintained by clam cleat.



5 Tug sharply to release rope and continue pulling through the dropwire, continue procedure throughout route



6 .....fit dropwire clamps and complete job.

REMEMBER TO RECOVER THE POLE BELTS

SECTION 9
Hollow pole techniques

GENERAL REFERENCE

1 This section is intended to be used as a reference manual for installation from ground level using hollow poles. Full details of the method to be used are described in Telecommunication Instruction A2N1062.

2 Equipment : The following items are required to carry out the method described :

a. A 15 metre length of Line Sash No. 2 (to each end a galvanised wire loop is secured and bound see above mentioned TI).

b. Three and one half, Rods Duct No. 2 (for rigging the pole.)

c. Rigging head.

d. Rigging weight.

e. Pulley Dropwire No. 2.

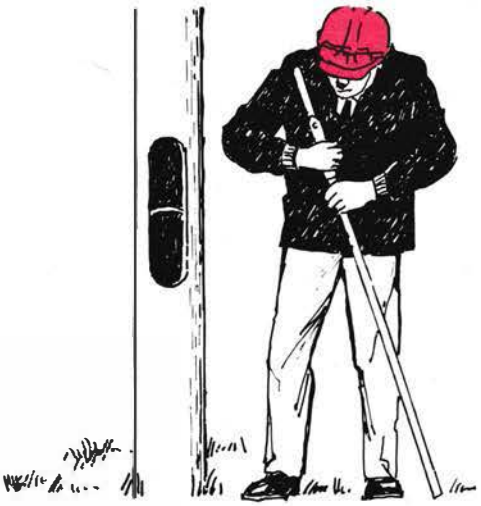
f. Dropwire Dispenser, including pulleys dropwire,

together with necessary cones and road signs.

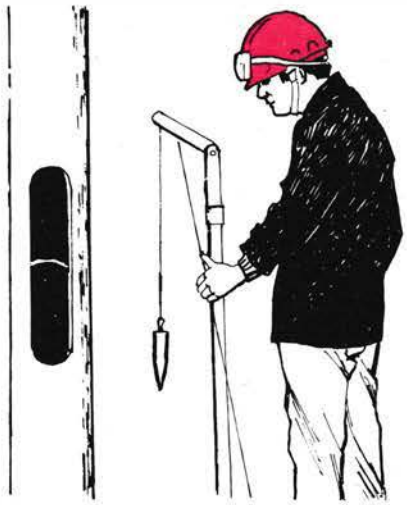
METHOD Hollow Poles
General Installation

A Gas test MUST be carried out before work commences inside pole

1 The pole cover should be removed.



2 Screw rigging head to standard length of Rods Duct No. 2. Pass end of rigging line through pulley, ensure line runs freely.



3 Attach rigging-weight snap-hook to wire loop at the end of rigging line.

Ensure tension on rigging-line during rodding

4 Insert rigging-head and first section of rod through door in pole. Connect further sections of Rods. Duct No. 2 as required.

5 When rigging head clear of pole-cap, gently rotate rods until correct radial position then lower weight to ground.

6 Remove Rods. Duct No. 2 and secure internal and external lines to either door lintel or pole belt at door threshold.

NOTES

1 Installation of individual drop wires – proceed in normal way as described in previous sections or TI C2A1002.

2 At the pole the dropwire should be temporarily secured with clamp Dropwire No. 6 and then clipped onto the anchor ring.

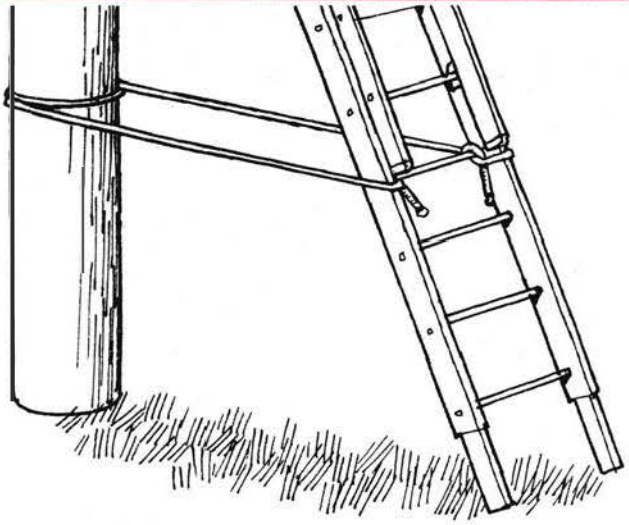
3 The customer end of installation is completed and finally, at the pole, the dropwire is tensioned and the Clamp Dropwire No. 6 permanently fitted and clipped under the anchor ring in the pole, ensuring that the locking loop on the clamp is correctly positioned.

4 Cut the dropwire to one metre in length (a guide is to pull the dropwire to the bottom of the door, loop around finger, pull it up to the top of the door and out at the lintel).

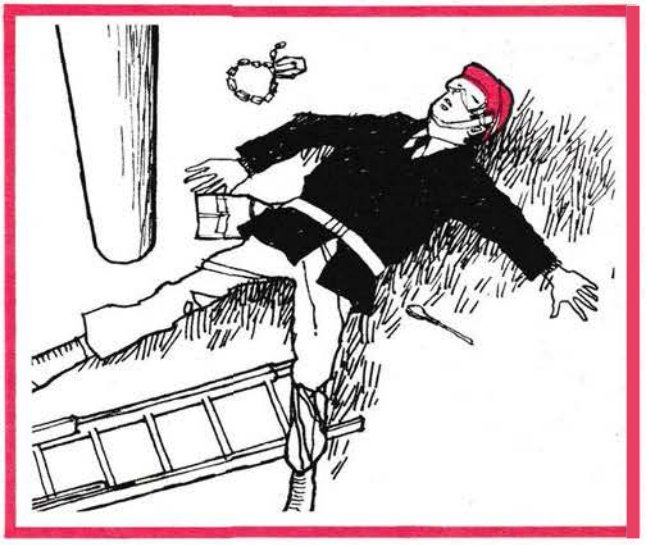
5 Remove the sleeves Polythene No. 3A and terminate the dropwire in the BT 71A.

6 Replace the sleeves polythene No. 3A.

7 Replace the pole cover.

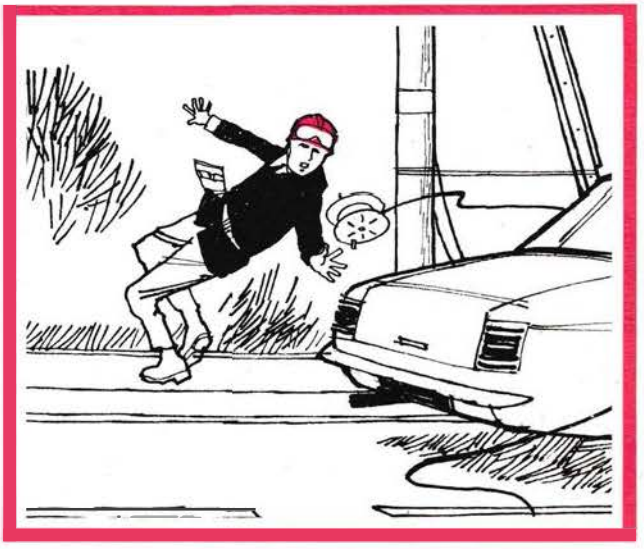


DO lash ladder at **foot and top** of pole



OTHERWISE...

DO lay sash flat in road when paying out



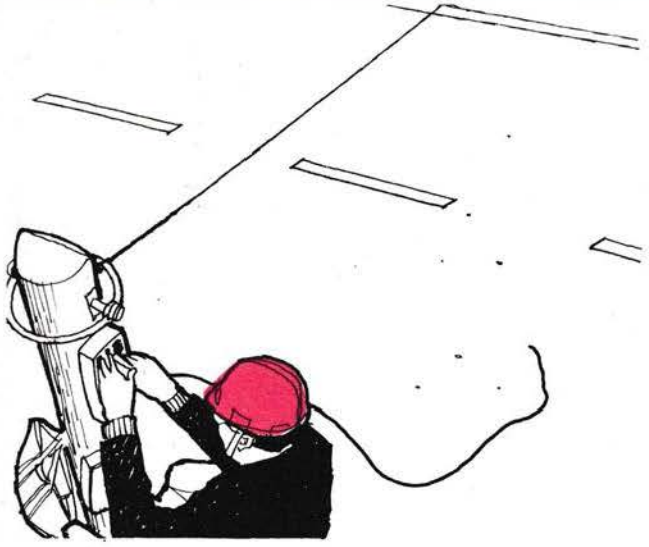
OTHERWISE...

DO take up slack thus reducing pulling up time

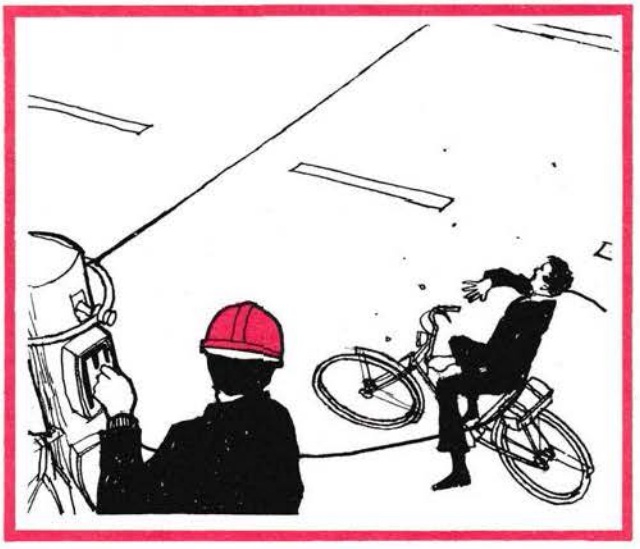
OTHERWISE...

DO NOT Take the weight of a span at the house end

OTHERWISE...

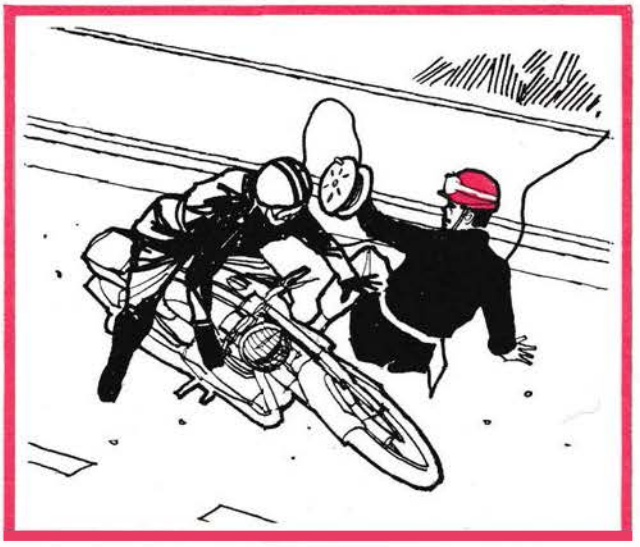


DO NOT Allow ropes to blow freely in the wind



OTHERWISE...

DO NOT Walk backwards across the road



OTHERWISE...

SECTION 11
Looking after equipment

DISPENSER AND PULLEYS

Always:

1 Before use check that the dispenser and the pulleys are in good working order and free from cracked welds, broken parts or loose nuts.

2 Check particularly the condition of the chain and catch on the pulleys.

Occasionally:

3 The large thread on the spindle and the ends of the spring on the dispenser should be smeared with grease.

4 The lock of the dispenser and the bearings of the pulleys should be lightly oiled.

Sashlines

1 To reduce springiness and the tendency to twist and kink, new sashlines should be pre-stretched by tying to a convenient fixed object and pulling hard on the other end. (This operation should be repeated at not less than 3 monthly intervals to ensure that the line has not been severely weakened by wear or rotting).

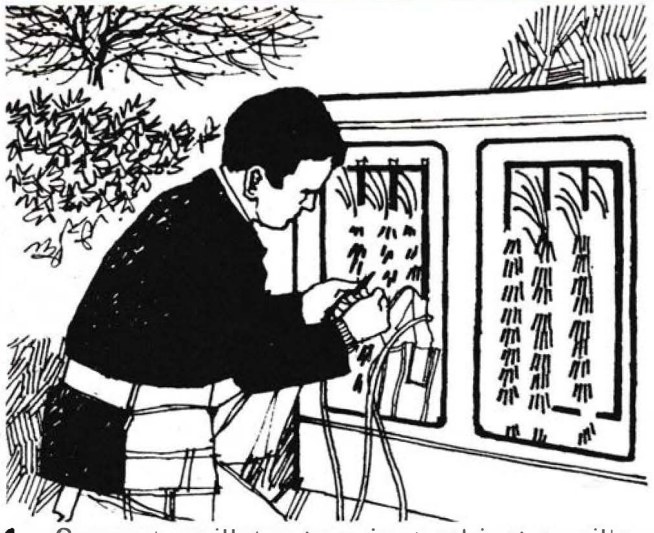
2 Inspect the line for wear, indicated by broken or frayed strands.

3 If there is any doubt about the condition of the line change it at once.

4 Substitutes should not be used in place of sashline No. 2. Most of the plastic lines which are available are liable to kink and do not lie flat on the road surface.

SECTION 12
Working with small aerial cables

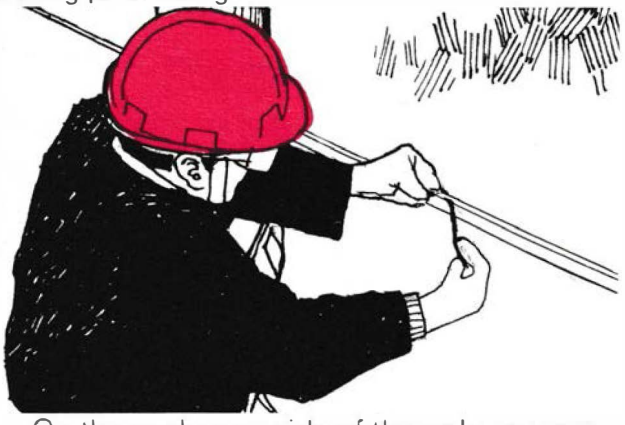
This section sets out in brief the method to be followed when the provision of service necessitates the extraction of a pair of wires from an aerial cable using Aerial Closure Kit NO.1.



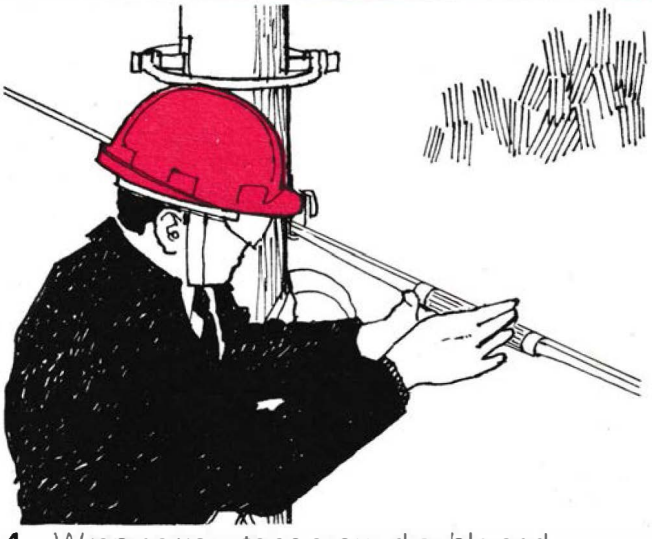
1 Connect oscillator to pair at cabinet or pillar to enable identification of the pair. Proceed to site.

2 Determine location of telephone and lead-in.

Provide dropwire span(s) employing the correct dispenser method described previously using a bracket No. 22 on the pole when there is no existing pole fixing.

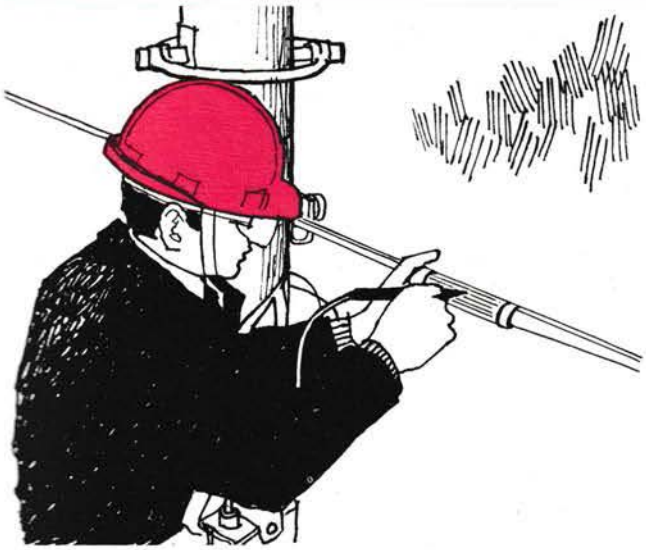


3 On the exchange side of the pole remove the cable sheathing with nylon cord provided.

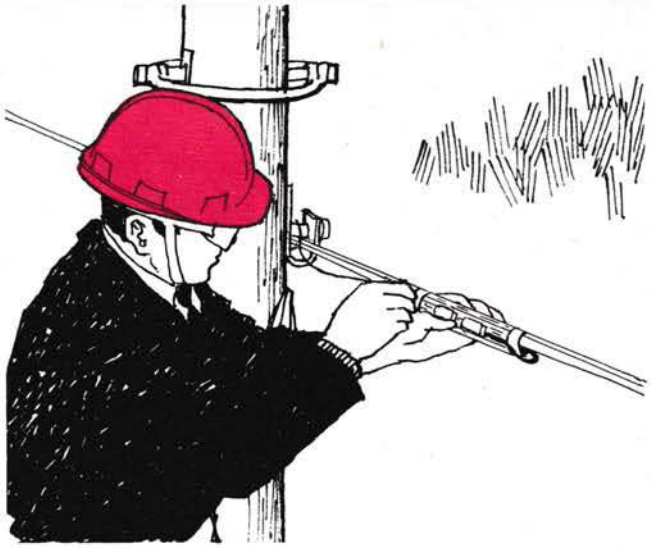


4 Wrap narrow tape around cable and suspension wire.

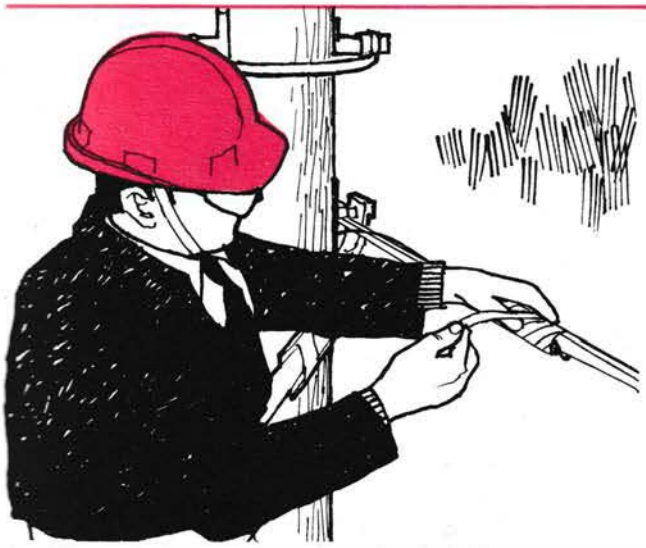
THINK SAFETY



5 Identify pair with probe if necessary.



6 Terminate the pair and dropwire using connectors D/W No. 1.



7 Close joint as stated on Aerial closure Kit No. 1

Do not forget to recover the oscillator at the cabinet or pillar.

SECTION 13
Working with underground cables

When it is necessary to joint underground cables in order to provide the customer with service the installer should refer to the Telecommunications Instructions listed below.
As circumstances vary considerably, only the safety measures to be followed when working on underground plant are given in this section.

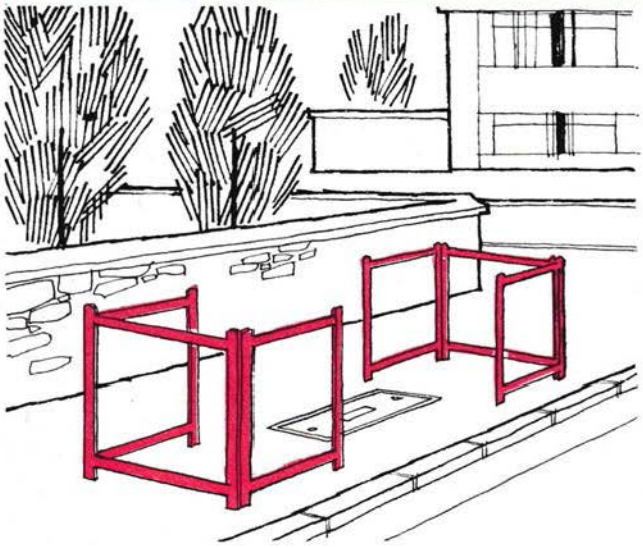
References

Engineering Safety Guide (Rg41)
Telecommunications Instructions

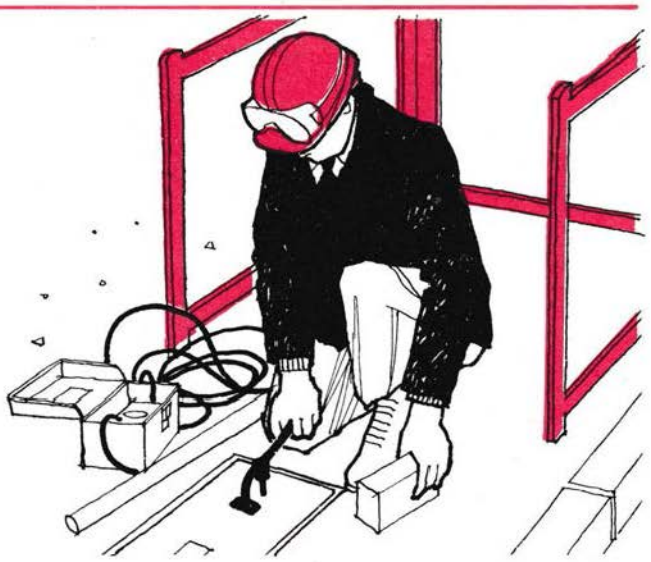
A2G0155	Footway joint – box cover removal
A2G0301	Cabinets cross-connexion
A2G0302	Pillars
A2H2603	Conductor jointing using connectors wire insulated and pliers crimping

References (cont.)

A2H2606	Jointing spur cables of up to 20 pairs, to distribution cables using sleeves polyethylene Nos. 41 and 42
C2B0005	Portable apparatus for cable and pair identification
C2B0015	Identification of cables and cable pairs
E3H1110	Explosive and asphyxiating gases
E3H1125	Indicator Gas No. 5
M4E 0610	Precautions against accidents.

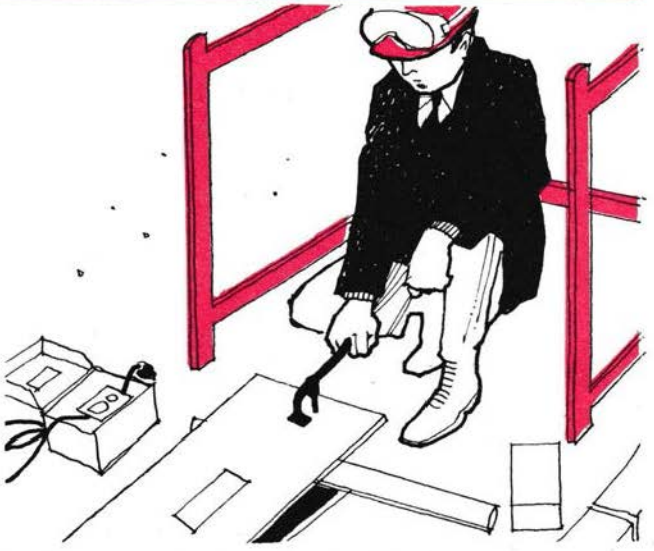


1 Guard the joint-box.



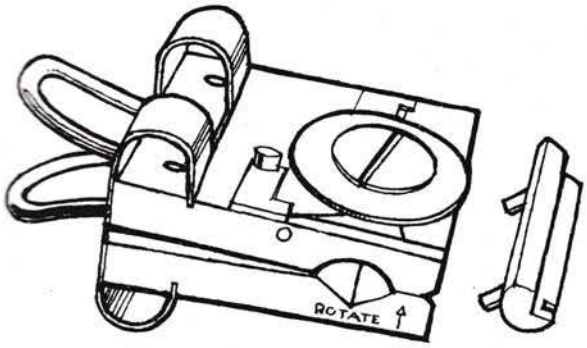
2 Use the correct tools to lift the joint-box lid.

3 Take a gas test.



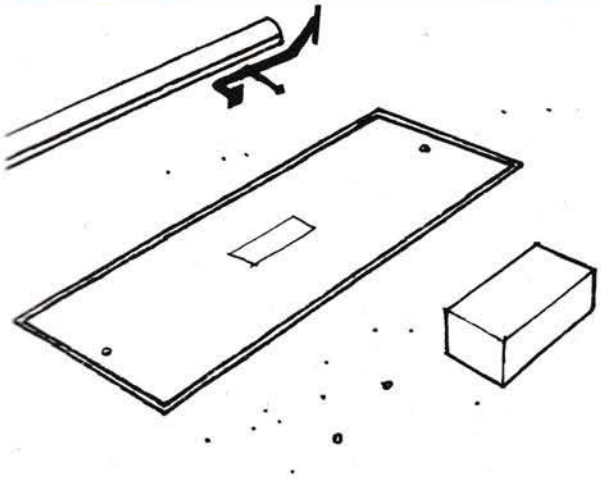
4 Remove the joint-box lid in the correct manner.

BE TIDY – OTHER PEOPLES SAFETY IS YOUR CONCERN

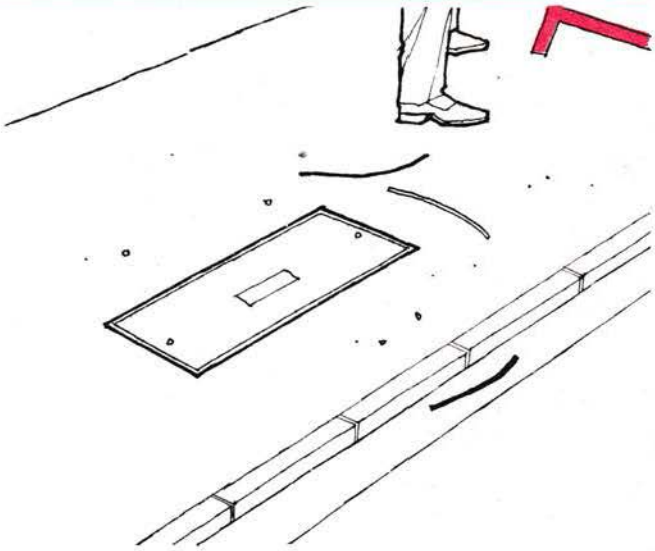


5 The correct tool speeds job completion.

6 Use your eyeshields and gloves when handling resin.



7 Replace the lid ensuring that it seats properly in the frame.



8 Take your rubbish with you.

NOTES

Every time the Gas Indicator is used the following procedure must be undertaken.

1 Ensure the aspirator mechanism does not leak.
2 Ensure the aspirator mechanism is not blocked.
3 Purge the indicator.
4 Check electrical circuit.
5 Check battery condition.
6 Adjust the indicator.

REMEMBER

7 NEVER leave discharged cells in the indicator.
8 Replace the detector filament every twelve months or when petroleum vapour encountered.

HAVE YOU THE SAME NUMBER OF TOOLS YOU STARTED WITH?

NOTES

INSTALLER .....

HEADQUARTERS .....

OFFICIAL TELEPHONE NUMBERS			
name or duty		exchange	number

A1170 Printed by Belmont Press Northampton