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TELEVISION TECHNICAL OPERATIONS DEPARTMENT

SAFETY INSTRUCTION NO. 14

THE PREPARATION AND USAGE OF STUDIO EQUIPMENT

BY TEL. TECH. OPS. STAFF

In addition to the usual circulation, this Safety Instruction is issued to each member of Tel.Tech. Ops., since it defines the responsibilities of all categories and grades of staff towards the handling of studio equipment. In future all members will be expected to be conversant with the routines and procedures given within, taking steps to ascertain any correct methods referred to but not explained.

Issued by H.T.O.Tel.S.

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1. Introduction

All equipment handled by Tel.Tech.Ops. staff is potentially a source of trouble; it is likely to be fragile, expensive and complicated, yet simultaneously a danger both to the operator and to people in the vicinity. It is vital therefore that all preparation and usage is undertaken with due respect and in accordance with the procedures detailed herein.

This Instruction has been prepared mainly for the guidance of Tel.Tech.Ops. studio staff, although it has general relevance throughout the department. It is issued as a Safety Instruction because of the importance of handling equipment in accordance with laid down safe procedures. It contains however, much general guidance and instruction. Note that the responsibilities defined herein are not to H.T.O.Tel.S. directly but through his representative in the studio who is the T.M.I (or the T.M.II if there is no T.M.I allocated to the production).

Tel.Tech.Ops. Safety Instruction, No. 1 defines the overall responsibilities of H.T.O.'s representative on matters of safety in the studio. These responsibilities may not be further delegated and the representative should oversee all studio operations.

Note: The three sections which follow are each arranged so that information is given in the order: rigging, usage, derigging. Part 2 is applicable to all studio staff since it is concerned with general routines and procedures; Part 3 concerns Camera staff and Part 4 Sound staff.

2. All Studio Staff

2.1 Crew Responsibilities

The Senior Cameraman is responsible for the supervision of all work undertaken by the members of his crew. He is expected to supervise in person the rigging and derigging work performed by the camera crew and also to ensure that operational camera duties are carried out correctly and safely. He will normally delegate to the Sound Assistant I responsibility for the supervision of the rigging and derigging of sound equipment although it is emphasised that all rigging and derigging is regarded as being a crew rather than a sectional activity.

The Sound Assistant I is responsible for the supervision of all work undertaken by members of the sound crew independently. He is responsible at all times for ensuring that members of the sound crew carry out their operational tasks correctly and safely.

Individual members of crews are responsible for carrying out all duties undertaken correctly and safely, obtaining instruction and help whenever this is necessary. They should be familiar with the contents of this instruction, which must be obeyed at all times.

## 2.2 General Rules

The following rules are designed to safeguard staff and equipment. They should be obeyed as a matter of routine by all Tel.Tech.Ops. staff.

- i) Before any apparatus is touched, especially at the commencement of rigging, a competent member of the crew should ensure that it is not in an unsafe condition. Bear in mind that the results of any meddling are unlikely to be obvious. Checks should be:
  - a) Electrical security, especially that all operating and power supply switches are in OFF positions.
  - b) Mechanical security of components, particularly that of the camera mounting on the panning head.
- ii) Lifting heavy equipment is not to be achieved solely by the application of brute strength. Correct lifting techniques have been taught to some members of staff which they will pass on. If you do not know the correct way, ask. Always make sure you have plenty of help.
- iii) Use only the lifting handles or load-bearing handholds. Never use the controls, they were not designed for such purposes.
- iv) Do not endanger yourself or your colleagues by careless handling of power cables. Always rig from the equipment back to the power point and never switch on without making sure it is safe to do so. (De-rigging should commence with switching off and unplugging the power cable).

- v) Safety Instruction No. 1 forbids Television Technical Operations staff to commence any abnormal work without authorisation from the T.M. (Supervisory). Always ask for authorisation if there is any doubt, especially when this work concerns temporary structures.
- vi) All rigging should be in accordance with Safety Regulations which require that:-
  - a) Where cable rails are provided, all cables and flexible pipes should pass below the lower rail;
  - b) Where cables cross escape routes they should be covered with the ramps provided;
  - c) No technical apparatus should be allowed to obstruct escape routes.

The safety of staff, artists and visitors is paramount and should not be jeopardised by rigging no matter how urgent.

Staff should also bear in mind that much of the equipment they is both costly and fragile and must be treated carefully.

- vii) All access and usage of studio grid areas is restricted. Each member of staff should obey T.T.O. Safety Instruction No. 9 "Studio Grid Areas".

## 2.3 Duty Positions

Unless permission has been obtained from the appropriate Supervisor, Tel.Tech.Ops. staff are required to be at their duty positions during all scheduled hours, whether or not the equipment they operate, or are responsible for, is in use.

Each member of Tel.Tech.Ops. should ensure that he is ready in the studio at his duty position at the commencement of all rehearsal periods, particularly after meal or coffee breaks.

## 2.4 Floor Marking

Studio floors should not be marked except in accordance with the following:

**Tel.Theatre:** Usual markers may not be used on the vinyl floor. "Magic Markers" may be borrowed from the Studio Engineer for all marks on this surface. Other surfaces as all other studios.

**Other Studios:** Only crayon (timber chalk) and off-white linen tape may be used. Felt-tipped pens, cellulose based tape and all other methods are forbidden

At all times marks should be kept to an absolute minimum size and all tape must be removed from the studio floor at the end of productions.

## 2.5 Adjustment of Technical and Mechanical

### Equipment

Television Technical Operations staff are not authorised to make other than routine adjustments to equipment. As a general rule only where controls have been provided in accessible and safe positions and where instruction is given to staff in the use of these controls, may they be adjusted by qualified Tel.Tech.Ops. staff without supervision. In all other circumstances, particularly when there is any doubt as to the correct and safe procedure, the Studio Engineer should be consulted.

Whenever protective covers are removed from equipment while it is switched on, the likelihood is that live terminals will be exposed and, especially in the case of cameras and picture monitors, these terminals may be carrying lethal voltages.

## Camera Equipment

Staff must not adjust the position of the wander plugs in E.M.I. cameras which control viewfinder H.F. boost because there is a risk of electric shock if this is done whilst the equipment is live. The Studio Engineer will make any necessary adjustments on request.

## Picture Monitors

Staff may only adjust external controls on picture monitors. The Studio Engineer should be asked to arrange for other necessary adjustments to be made by qualified staff.

## 2.6 Derigging

Each production is allocated either 15 or 30 minutes for derigging and other departments must observe this. There should be no derigging of electrical equipment, properties or scenery during the scheduled derigging period unless Technical Operations derigging is complete.

### 2.6.1 Booked Equipment

All booked equipment which was collected and brought to the studio by Tel.Tech.Ops. staff should be returned to the Technical Store or storage area. Equipment which was delivered to the studio by engineering porters should be prepared for transit before it is left in the allocated place.

### 2.6.2 Studio Equipment

Cameras, mountings and monitors, booms, loudspeakers and microphone stands should be unplugged and the cables should be coiled neatly. The equipment should then be placed in accordance with the following:

**Television Centre:** in the Technical Equipment Store adjoining each studio.

### Riverside I

: in the two designated stores:

#### Store A

: cameras and mountings, coiled cables, booms, column loudspeakers and studio monitors on trolleys.

#### Store B

: zoom lenses, microphone stands, lead weights, panning handles and slingable monitors.

### Lime Grove, Television

Theatre & Riverside 2 : in the designated area in the studio. The position and size will be found marked on a floor plan affixed to the studio wall.

#### 2.6.3 Crew off-duty

Before crew members are allowed to leave at the conclusion of derigging, the Senior Cameraman should satisfy himself that:

- a) all equipment, both vision and sound, is cleared from the studio in accordance with laid down procedures or placed tidily in the designated area;
- b) all marking tape has been removed from the studio floor;
- c) all switches and isolators controlling technical supplies are in the OFF position except where these concern equipment left switched on at the request of the Studio Engineer.
- d) all routines specified in other sections have been carried out as appropriate

### 3. Camera Equipment

In addition to his general responsibilities, the Senior Cameraman is responsible for the collection of all studio and booked camera equipment, and for its rigging in accordance with the production plan of the Technical Manager, deploying his staff in such a way that necessary rigging is completed and operational equipment is in its planned opening position and in full working order before the commencement of rehearsal.

Cameras should by this time should be plugged in accordance with the plan, properly placed on the specified mountings and complete with any planned optical or other attachments which should be fitted in such a way that operational camera work is not impeded. Mountings should be balanced and in good operational working order; talk back and other ancillaries being confirmed and satisfactory.

Camera staff should be at their duty positions, ready to undertake operational duties at the commencements of scheduled rehearsal time.

Where the rig is of such complexity that it is not concluded before the commencement of rehearsal, the camera crew should be split in such a manner that by this time, all rigging essential to the opening scenes is completed and allocated staff are freed for operational tasks.

### 3.1 Cross-Plugging of Studio Cameras

Two cameras may be cross-plugged in any studio except R.I., where the condition of the patching equipment precludes this, if this will obviate a considerable amount of rigging or re-rigging effort. E.I.C.Tel.S. has issued the following conditions:

- 1) All arrangements must be made through the Technical Manager;
- 2) All cross-plugging must be done at the vision mixer patching panel to preserve the camera/CCU relationship. Camera "On Air" cue light numbers should be altered accordingly;
- 3) The Camera Crew must remain available in the studio until the Studio Engineer has advised the T.M. that equipment is functioning properly. This applies both at the time of cross-plugging and at the end of the production, when everything must be restored to normal. No camera equipment which has been involved in any cross-plugging may be unplugged and removed from the studio until the Studio Engineer has authorised this.

### 3.2 Mounting and Demounting Cameras

#### 3.2.1 Preparation of Mountings

All pedestals: Check that all safety pins and bolts are applied and properly engaged, set wheels at right angle to intended direction of camera movement.

Safety Pins: Never remove a safety pin until the camera has been properly locked on to the panning head.

If the Safety Pin of a Spring Pedestal proves difficult to extract when the camera is in position, it probably means that the pedestal is out of balance. Do not force the pin but consult Studio Engineering or Mechanical Workshop staff.

Vinten Motorized : Check that the power is switched off.

M.P.R.C. Crane: Check that the safety strap is securing the crane arm properly and that the power is switched off.

Heron Crane: Ensure that there is insufficient hydraulic pressure available to operate either the crane arm or the driving wheels and that the dolly mode is selected. Close the hydraulic system shut-off valve.

Lightweight Tripod: Check that all legs are locked.

Hired mountings such as Chapman Hercules: The driver is in charge of mounting and demounting operations. There must be no attempt to operate any controls unless he gives instructions.

Before mounting or demounting the camera:

- a) see that the camera cable is unplugged;
- b) make sure the camera yoke is locked;
- c) position the panning handle where it will not interfere with subsequent operations.

### 3.2.2 Mounting the Camera

Once the wedge has been located correctly by the shoe of the panning head, the locking bar should be closed and the safety pin inserted. The camera may now be cabled and switched on.

### 3.2.3 Demounting the Camera

The camera should never be placed upon the floor. If it is to be remounted it should be transferred immediately; otherwise it should be placed securely on a trolley provided for the purpose. Studio Engineers will always make these available.

### 3.2.4 Switching on the Cameras

All plugging of cables should be checked by a competent member of the camera crew before a clearance is given for cameras to be switched on. The Vision Supervisor may be informed of the points in use before this.

### 3.2.5 Lead Weights For Camera Mountings

E.i.C.Tel.S. has instituted the system described below to prevent further losses of the lead weights used for counterbalancing on camera pedestals. While all Tel.Tech.Ops. staff must follow the appropriate routine carefully, the Senior Cameraman is responsible for ensuring that;

- a) any discrepancies are notified to the Studio Engineer;
- b) all weights are properly locked at all times;

- c) at the conclusion of the production, all weights are returned to their allocated positions, securely locked and the keys and spare padlocks and chains returned to the Studio Engineer.

### i) MPRC Crane

A padlock, which is lettered for identification purposes, and a chain has been fitted to the bucket of each crane in order to lock the weights in position. The standard allocation of weights is 21 and whenever it is necessary to amend this, the appropriate keys should be obtained from the Studio Engineer.

### Surplus Weights

Any weights removed must be locked into position in the nominated storage area of the studio.

A padlock and chain should be obtained from the Studio Engineer.

### Storage Areas

T.C. and Riverside Studios : Under the staircase leading to the Vision/Lighting Control Room.

Lime Grove: Studio 'E' : In the Vision/Lighting Control Room

Lime Grove: Studios G & D : In the Vision Apparatus Room

Television Theatre : In the Maintenance Room.

### Additional Weights

Extra weights have been provided in each area for use as necessary. The keys to unlock the padlocks are held by Studio Engineers.



Additional weights are available as follows:

Storage Areas:

Television Centre: Studio 4 local  
technical  
equipment store : 2 weights  
Riverside Studios: Equipment Store  
'B' (Off R.1) : 2 weights  
Lime Grove : Studio G: Vision  
Apparatus Room : 2 weights  
Television Theatre: Maintenance  
Room : 2 weights

ii) Ring Pedestals

The trays are fitted with padlocks so that the weights cannot be removed without the use of a key. Each Studio Engineer and Mechanic has been issued with a key which fits these padlocks and this should be borrowed whenever any adjustment is necessary.

Surplus weights are stored in the following areas:

Television Centre : In the lockable cupboard fitted into the work benches in local technical equipment stores of TC1, TC3 and TC4.  
Television Theatre: In the lockable cupboard along the corridor from the Maintenance Room.  
Other Studios : In studio Maintenance Rooms.

In all cases keys to the lockable cupboards are held by Studio Engineers. Surplus weights should be returned to the allocated area after productions only if they are no longer required on the pedestal. If however, a pedestal has to be prepared for transit to another studio or centre, the maximum number of weights should be locked in the tray as a matter of routine.

3.3 Fitting Lens Systems

3.3.1 Fixed Lenses

The widest angle lens should be placed in the Number 1 position and the remaining lenses fitted in the order in which they diminish in angle.

Care must be taken to ensure that the lenses are properly mounted and clamped. To this end Senior Cameraman must arrange that:

- a) only camera staff, who are fully conversant with the methods of securing lenses, do so without supervision.
- b) every cameraman examines the security of the lenses on his camera before each period of studio operation as a matter of routine.

Because there have been cases where lenses were not properly clamped, the following notes are issued for guidance.

E.M.I. Cameras (TC1, 4 5, G & E): These are fitted with additional locating pins. The clamp is bearing correctly upon the lens flange when it is seated between the pair of locating pins. The clamp should be pressed home before the knurled bolt is tightened.

Pye Cameras (R1, R2, Tel.Th.): The semi-automatic clamps turn only when the friction between the bolt and the clamp is greater than between the clamp and the lens flange. Consequently the bolt should be unscrewed by two or three turns in order to make sure that there is adequate clearance between the clamp and the lens flange.

Whenever zoom lenses are fitted, one or more of the fixed lenses mounted on the camera will need to be removed.

These lenses must be handed to the Studio Engineer for safe keeping or placed in the cupboard provided. Cover plates should be placed over the blank holes to reduce ambient light and to protect the equipment from dust, etc.

### 3.3.2 Rebalancing of Cameras

Alterations to camera balance may be carried out by Tel.Tech.Ops. staff without the assistance of either studio engineering or mechanical workshops staff, whenever the camera has been fitted with a sliding plate. The tools required (a special key and an Allen key) may be borrowed from the Studio Engineer.

The procedure recommended by E.i.C.Tel.S. is:

- a) Slacken off the Allen screws in the side of the plate;
- b) Tilt the camera slightly in the required direction of movement;
- c) Fit the special key to the end of the threaded rod and rotate until the point of balance is reached;
- d) Tighten the Allen screw in the side of the plate. This is vital.

- Notes: 1) When a prompting device is fitted, the end of the threaded rod is obscured and balance has to be found by trial and error.
- 2) The Studio Engineer will be available to give any requested advice or assistance.

### 3.3.3 Zoom Lenses

Varotal: The Varotal Mk II should be fitted into the No. 4 position adjacent to the 2" lens and care should be taken to see that the iris settings are the same. When attaching the control systems make certain the cables are not kinked and are running in a smooth course.

Note: there must be no operational turret movement.

Angenieux: All fixed lenses should be removed and the holes covered. The iris setting should be matched to the iris motor calibrations. The lens must be properly secured, using the two stays, and the control units plugged up before the power is switched on. See that the cables are not likely to foul any part of camera or mounting during the operation.

- Notes: i) there must be no attempt to rotate the turret;
- ii) remove the lens cap before testing the action of the zoom;
- iii) when fitting Angenieux zooms to Pye cameras ensure that the dummy plug is removed. This protects the turret motor from being continuously energised if the zoom/turret switch is in the wrong position.

Component Parts : All the component parts of Angenieux zooms are marked with the number and all lining up of zooms is done using the correct components. Staff collecting the equipment should confirm that the correct components are in the box since a zoom composed of unrelated components will not be satisfactory in operation.

## 3.4 Operation of Powered Mountings

### 3.4.1 General Rules

Immobilization: all mountings should be rendered inoperable when unattended.

Power Supplies; all supplies should be switched off on all occasions when the mounting is to be unattended and, whenever this is likely to be for more than a few minutes, the isolator at the wall point should be broken.

Cable guards: must be in position whenever the mounting is not in transit over uneven surfaces. The normal studio working position for cable guards is as low as possible without touching the floor.

Brakes and safety locks: should be checked daily.

Cables: should be properly clamped and care should be taken to ensure that while sufficient slack is available, there are no excessive loops which could catch in controls or other projections.

#### 3.4.2 Operational Restrictions

All restrictions which follow are imposed for reasons of safety and must be observed at all times:

- a) Safety helmets, belts or harness must be worn whenever specified either by Safety Instructions or by H.T.O.Tel.S's representative in the studio.
- b) Mounting operation should be restricted to the designated crew member, his deputy or a trainee under supervision. With powered mountings it is particularly important that one man should be responsible for all operation during rigging and derigging.
- c) Non-engineering staff, artists and visitors must never be allowed to operate or ride on mountings without the prior consent of the T.M. (Supervisory).
- d) Untrained staff must never operate mountings unless supervised by a competent operator.
- e) Whenever the operational crew of a mounting exceeds 1 (M.P.R.C. crane etc.), the driver should not drive the mounting when other members of the crew are not present unless this is unavoidable. He should first ensure that the route is absolutely clear of people and obstructions before undertaking such an operation.

### 3.5 Derigging of Camera Equipment

No derigging may commence until permission has been received from the T.M. (Supervisory).

#### 3.5.1 Switching Off Cameras

At the conclusion of operational periods the T.M. (Supervisory) is responsible for advising the Studio Engineer that cameras are no longer required. The Studio Engineer switches off all equipment except any that he wishes to keep on for test and advises the T.M. (Supervisory) of the situation.

This information is passed on to the crew by the T.M. (Supervisory) together with the necessary permission to unplug cameras, etc.

#### 3.5.2 Booked Equipment

Equipment booked for the production and drawn by crew members from Technical Stores should be replaced in carrying cases and returned to the store or storage area.

Where mountings are to be removed from the studio the extent of de-rigging should conform to instructions received from the Equipment Allocations Office. If cables are removed they should be properly coiled and stowed in the appropriate space.

#### 3.5.3 Studio Equipment

Studio Cameras and other equipment should be put away neatly in accordance with the procedure given for all studio equipment in section 2.6.2 and the following.

##### 3.5.3.1 Camera Cables

Tarpaulins which measure 6' x 3' and are fitted with rope carrying handles have been provided. The cable should be coiled onto the tarpaulin in a figure of eight. The cables may easily be transported and will store one upon the other.

One two-wheeled trolley, fitted with a former on which a camera cable may be wound, is now on trial.

### 3.5.3.2 Camera Covers

Covers have been made available for all studio cameras and should be used whenever cameras are not cabled. Inform the Studio Engineer if numbers are not sufficient. While the cameras are in use the covers should be folded and stored in equipment areas.

### 3.5.3.3. Lenses and Optical Systems

In studios where Angenieux zoom lenses make up a proportion of the studio lens complement, they should be left in position on the cameras unless instructions to the contrary have been received by the Senior Cameraman.

At all times when handling lenses avoid touching optical surfaces.

Booked zoom lenses should be removed from the cameras and returned to the Technical Stores or indicated storage area.

- a) When zoom lenses, and/or prompting attachments etc. are removed from cameras, staff should bear in mind the arrangements which were necessary to counter the additional weight and restore the original conditions. For example, the extra weights should be removed from the bucket of a M.P.R.C. crane and stored in accordance with the procedures laid down, Section 3.2.5.
- b) Care should be taken that only components bearing the same number are returned to storage boxes.
- c) Tie bars and fixing screws are supplied with Angenieux zooms and should be replaced in the carrying cases.

- d) Fixed lenses that were removed from cameras for the duration of the production should be collected from the Studio Engineer and mounted carefully and in the correct order.
- e) Where insufficient fixed lenses are available, all blank holes should be covered by blanking plates.
- f) Any lens hoods or other items which were removed for the duration of the production should be replaced.

### 4. Sound Equipment

The Sound Assistant I is responsible for the collection of all studio and booked sound equipment and for its rigging in accordance with the production plan of the Sound Supervisor, deploying his staff in such a way that necessary rigging is completed and operational equipment is in its planned opening position and in full working order, before the commencement of rehearsal.

By this time booms and other items of sound equipment should be cabled, care being taken to route them with the regard for production needs; talkback, foldback and P.A. circuits should have been proved and satisfactory levels established, and sound staff should be at their duty positions ready to undertake operational duties.

Where the sound rig is of such complexity that it cannot be completed before the commencement of rehearsal, the sound crew should be split in such a manner that essential rigging is completed and the staff required to work on the opening scenes are available to the producer.

#### 4.1 Microphones

Microphones are delicate pieces of equipment which should be stored in the boxes provided except when rigged. Microphones must never be placed on any surface other than a clean sheet of paper, even for short periods. This applies particularly to microphones which contain magnets since they are prone to attract metallic particles but this rule should be observed scrupulously by all staff at all times.

The rigging of powered microphone should be in accordance with the terms of Section 2 of this Instruction.

##### 4.1.1 Slinging

All slinging of microphones should be strictly in accordance with the terms of relevant Safety Instructions (T.T.O.D. Safety Instructions 4 and 9).

##### 4.1.2 Boom Clamping

When fitting microphones in booms, care should be taken to ensure that the cable clip is properly engaged since this provides a degree of safety in the event of the microphone slipping out of the clamp.

The clamp should be tightened until the microphone is held firmly. (It is better that the grip is excessive initially since if this causes rumble it can always be loosened whereas if the grip is insufficient there will be no transfer of vibration but the microphone will be in danger of dropping out of the clamp).

##### 4.1.3 Security of Microphones

In view of the number of microphones which have been stolen over the years, great care should be taken at all times to keep unused equipment safely.

At all times unused equipment should be retained in a locked equipment trolley. This particularly applies during intervals between studio activity and staff should make a habit of returning spare equipment to a trolley and locking it before each meal or coffee/tea break.

Overnight all microphones and power boxes should be removed and stored overnight in the locked trolley. The keys should be left with the Studio Engineer.

#### 4.2 Booms

##### 4.2.1 Boom Movement

If it is to be done safely, movement of booms calls for great care, especially when manoeuvring in congested areas. Two men are recommended because of the number of factors which must be safe-guarded:

- 1) The Boom Pram : ensure that its route is free from obstruction.
- 2) The Boom Microphone Cradle: ensure that the microphone is not allowed to foul cables or to come into contact with any object which might damage it;
- 3) The Boom Tail: ensure that it is not allowed to strike any person or object at any time.
- 4) Cables: a watch should be kept to ensure that cables are never allowed to become taut or foul lights etc., which have been set. This particularly applies to slung cables.

##### 4.2.2 Cable Rigging

Due regard should be paid to the production requirements for each boom and the cabling arrangements should allow a boom to be moved to all its planned positions without the cables becoming taut or a hazard to people or other items of equipment in the studio.

Cables should never be allowed to hang at body height, they should always be well above head height or at floor level.

#### 4.2.3 Boom Balance

All booms have been balanced for a designated type of microphone and other types may be fitted only after consultation with Assistant (Sound Facilities) to H.T.O.Tel.S.

Since the arm of the boom is only in balance when the designated microphone is in the cradle, care should be taken to lock the arm securely before removing the microphone.

#### 4.2.4 Operational Usage

Before climbing onto a boom platform ensure that the boom is in a safe condition:

- 1) Mole Richardson Boom : make certain that the wheels are in the extended position and that the securing nuts are tight; check that the steering handle/ladder is clipped so that it is acting as a brake.
- 2) Fisher Boom: The red rubber handle is provided to help ascent. Never use the hydraulic control which is not designed to bear such a load.

#### 4.2.5 Boom Derigging

When coiling cables around boom platforms, arrange that sufficient slack is left for any alterations to the platform height to be made without stretching the cables.

Boom arms should be locked with the cradle well above head height.

Any departures from normal usage should be restored. This includes removing additional cables (P.A. etc.) and loudspeakers, and restoring any alterations to arm balance which may have been authorised.

#### 4.2.6 Booms on Rostra

Whenever a boom is employed above floor level special precautions should be taken as defined in Safety Instructions.

Raising/lowering is undertaken by riggers although Tel.Tech.Ops. staff may be called upon to help by dismantling and rigging booms.

Securing: a stationary boom used near the edge of a rostrum should be secured so that it cannot move closer to the edge than planned.

Safety Belts, harness : boom operators should wear whatever safety harness is laid down as being necessary, (Tel.Tech.Ops. Safety Instruction No. 6.)

#### 4.3. Loudspeakers

##### 4.3.1 Rigging

All rigging of loudspeakers should be in accordance with Section 2 of this Instruction since all kinds available for use are associated with potentials which might prove dangerous.

Line Source Loudspeakers are driven by remote amplifiers at potentials of the order of 100V. A.C.

Other Kinds have amplifiers built into the the units and consequently require a mains voltage as well as a sound supply

##### 4.3.2 Slinging

All slinging of line source loudspeakers must be carried out by H.S.E.'s riggers. Tel.Tech.Ops. staff may only position these loudspeakers (both 4ft Philips and 8ft Pams) as follows:

- a) in proper boom cradle mountings;
- b) on lighting stands;
- c) secured to studio walls, scaffolding towers or load-bearing structures approved by the Designer, when all rigging can be completed from the studio floor.

#### 4.3.3. Permanent P.A. Installation in T.C.1

A permanent installation of four foot Philips column loudspeakers covers a section of the studio against wall 2. The loudspeakers are suspended from hoists which are operated from the lighting gantry close to the Sound Control Room. Because of the limited space the loudspeakers have to be turned into a vertical position before they can be raised into the roof area.

Hoist Operation: up to six hoists may be selected at a time and raised or lowered by depressing the appropriate button. If the red lights marked "CAUTION : HOISTS LOADED" are alight this shows that one or more speakers are not in the vertical positions and the hoist must not be operated. Limit switches are fitted to protect the hoists and motors but care should be taken to ensure that the hoists do not foul any others or other equipment during operations.

Loudspeaker setting: unless great care is taken when lowering the loudspeakers into the horizontal position, the unit is likely to swing down, causing damage to the loudspeaker and injuring the operator. The recommended procedure is as follows:

- 1) Facing the front panel of the loudspeaker assembly, release one locking pin by pulling out and turning;
- 2) Supporting the loudspeaker with one hand, release the other locking pin.
- 3) Gently lower the loudspeaker into the desired position, locking it by means of the wing nuts on the stays.

To restore the unit to the vertical position the above sequence should be reversed. Note that both operations are probably carried out most efficiently and safely by two operators.

