Upwards Spin

White Card Assignment

The Brief

You are the Technical Stage Manager for a forthcoming production in the Athenaeum Theatre. You are attending the white card model meeting and the designer is explaining a proposed staging element in the show.

Act One set is a simple box set as in Diagram 1. There is no set dressing.

At the end of Act One, all three walls of the set must fly out and - due to the designers wishes and considering lighting and masking positions - the side wall must rotate 90 degrees during their movement in order to fly fully out of sight. (See Diagram 2)

This effect will be done in full view of the audience and will be lit and covered by music

Your task is to supply working drawings and explanation of how this will be achieved.

Include a full list of all equipment required to achieve this.

Include costings and whether equipment is stock, borrow or buy (Budgets are tight so the cheaper the better)

Include the amount of crew need to rig and operate this effect

Estimate how long will it take to rig

Provide Risk Assessments and Method Statements for all activities

Please also list any other parameters, drawings, thoughts, restrictions, concerns, controls as you see necessary

Initial Thoughts

- Show is in the New Ath - understanding of what the grid, flys etc work like and are capable of.
- Swing of flats would knock any furniture, props or people in their path - but ‘No set dressing’ so this will not pose an issue. Sides of stage should also remain clear of people, and this will need to be controlled on the ground so no one is injured.
- All three walls must fly out, so any rotation solution must be doubled, and the back flat will likely fly on a separate bar (two fly ops at least)
- Could rotate around circular truss or track from above. However, head room is limited so this is not a viable option.
- Centre point of flat is in line with Bar 11 (Single Purchase Set)
- US flat is 50mm shy of Bar 15. This set should be re-spaced 50mm US so it can fly the piece.

Solution

- Each flat will be supported from one centre point, which will have the ability to pivot. This will be achieved by bridling the flat internally using steels and links, before hanging the final steel on a sling to allow twisting. A full diagram of this can be seen on Page 4.
- Four lines will be run to each flat. From top view (Diagram 1.1 and 1.2), lines A and B will be tensioned with the flat positioned at 90 degrees to setting line. These will act like steels, preventing the flat from turning clockwise when C and D are tightened.
- Lines C and D will be tensioned, holding the flat in position without any rotation, all four lines acting against each other to steady the piece.

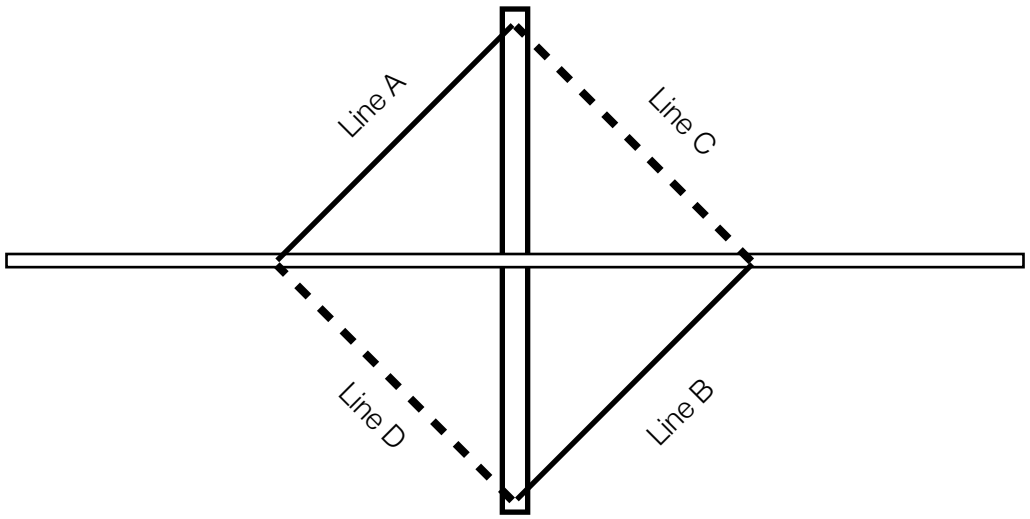


Diagram 1.1 - Top View (SR Flat)

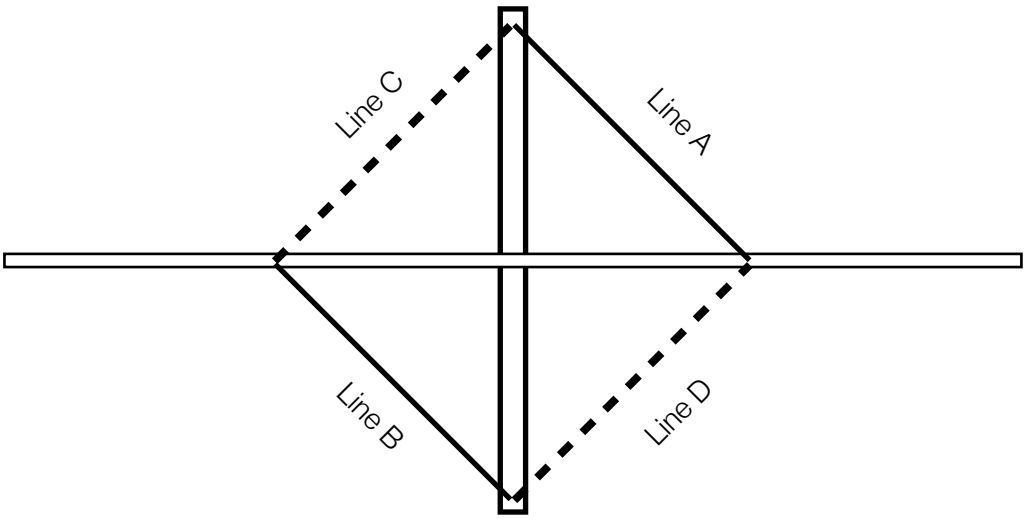


Diagram 1.2 - Top View (SL Flat)

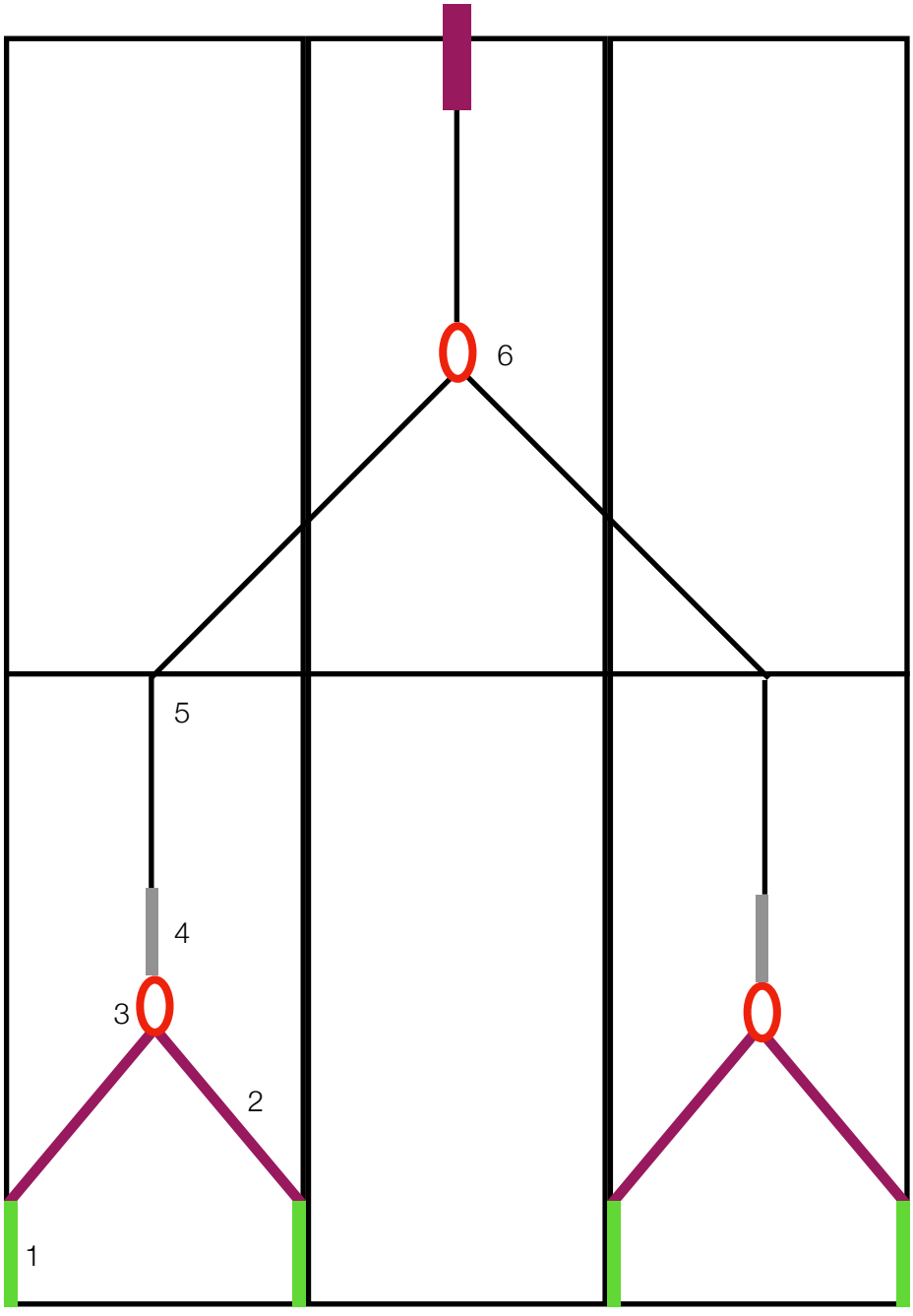
- Each line will be run from the top corner of the piece to a pulley on the bar, then up to a loft block which will divert it to a head block, and onto the respective fly floors. Pulleys for lines C and B will be hung on the DS side of the bar, with pulleys for lines A and D hung on the US side. This will allow the piece to turn full 90 when lines are tensioned.
- Due to the amount of lines used in this method, it's easiest to have the SR flat controlled from the fly floor, and the SL flat controlled from the Prompt Side fly floor.
- The rotation effect will be accomplished by slackening lines A and B, taking up all tension on lines C and D as this happens. This will swing the flat 90 degrees in the desired direction, the centre point pivoting on the strop, with the outside lines taking some of the weight of the piece on them. Lines A and B will now be lying horizontal to the bar along the top of the flat, and should therefore be invisible to any audience member.
- To prevent the flat wobbling, a small boom will be constructed on the SL and SR extremes of the bar, with a padded arm attached pointing onstage - just long enough to cushion the edge of the flat from the impact, whilst meaning it is stopped dead and cannot wobble US. These booms will be angled to cheat the arm US of the bar by enough so that the flat will lie perfectly parallel to the setting line when swung.
- As the bar flies out, tension will be maintained on lines C and D. A and B will be taken out slack so as not to affect the rotation of the piece as it flies, but still prevent them smiling over the front of the piece.
- When at their high trim, lines C and D shall be cleated off to ensure the flats cannot rotate freely in the air.
- To operate the effect properly, two fly ops will be required (one on each bar) alongside four additional crew (one per set of tightening/slackening lines). If possible, this could be cut down to two with practice and appropriate counterweighting of the C and D lines. With a TSM to spot the flight on the ground, the effect will require at least 5 people - though 7 is more likely. The entire effect could be rigged within one session, likely two and a half hours maximum.

The backside of the flats will be rigged like so, so as to facilitate the entire weight hanging from the centre point, whilst still providing enough support to have the piece fly safely.

1. 2 sets of 2 hanging irons, attached to the base of the flat
2. 4 x 1m strops, attached to the irons by 1T shackles
3. Strops are attached to 2 master links with 1T shackles
4. The master links attach to 2 turnbuckles, then onto 2 x 3m steels
5. Steels run through mid support batten of flat, then diverts at 45 degrees toward centre (though not ideal - as the SWL will be reduced by 30% - the weight of the flat should not be great enough to overload the reduced limit of the steels)
6. At centre, the steels attach to a master link with 1T shackles, with a 1m steel then linking to the 1m strop, which will be choked around the bar and fed through the top of the flat. This allows the flat to be as close to the bar as possible, and still allow the piece to twist when pulled.

Backside Flat Rigging Diagram (1:33 at A4)

Ideal flat construction would be in 3 vertical panels, with horizontal cross beam as shown



A PDF ground plan is also attached, which shows bar positions and where spot blocks should be positioned, with measurements.

Equipment List

The below equipment list covers all components required to rig the two rotating side flats, and the back flat. It does not take into account any other aspect of the production. Stock information taken from Paperclip (4th March 2018)

Item	Quantity	Source
1T Bow Shackles	48	Stock
1T D Shackles	8	Stock
Eye Screws	8	Stock
Master Links	6	5 From Stock - **1 Buy**
Turnbuckles	10	Stock
1m Strops	10	4 From Stock - **6 Buy**
1m Steels	2	Stock
3m Steels	4	Stock
5m Steels	6	Stock
Flying Irons	14	Stock
44m Hemp Lines	8	Stock
Double Sheave Rope Pulleys	4	**Buy**
Slotted Barrel Clamps	10	Stock
Double Sheave Loft Blocks	8	Stock
400mm Scaff Legs	4	Stock
Fixed Scaff Clamps	4	Stock
Black Tatt for Padding	2	Stock

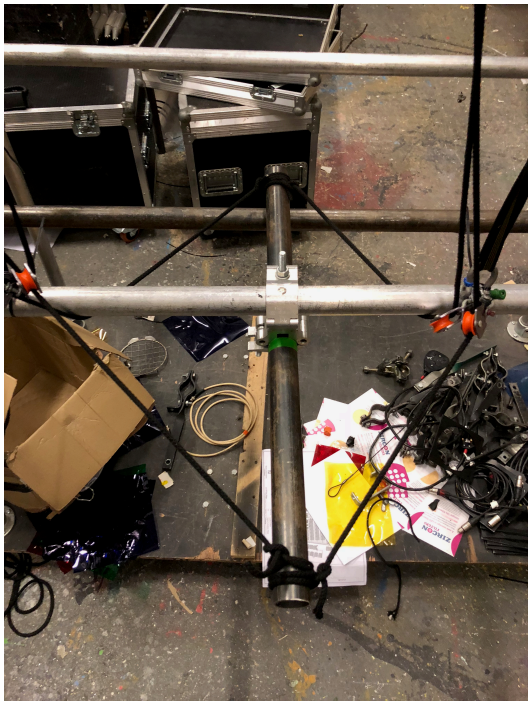
Initial Costings

The below costings include the items required to achieve the rotational spin effect, as requested by the designer at the White Card meeting for this show. It does not take into account any additional departmental purchases, consumables, or transport required for the performance - only those items required for the effect in question. These costings are correct as of 4th March 2018.

Description	Source	Quantity	Unit Price (ex. VAT)	VAT (%)	Unit Price (inc.VAT)	Cost (inc. VAT)
Double Sheave Yaught Blocks	Flints	4	£18.10	20	£21.72	£159.28
1000mm Slings	Flints	6	£4.74	20	£5.69	£34.13
Master Link	Flints	1	£5.28	20	£6.34	£6.34
TOTAL EQUIPMENT SPEND						£199.74

Development

- Original methodology inspiration was taken from Yale's 'Technical Design Solutions for Theatre V1'. However, this solution was heavily tailor-made to that particular situation and would not work as required for this effect. This methodology was then used as a starting point for my final proposal.
- The original concept was modelled using scaff, small pulleys, and sash. This proved the methodology was sound, and highlighted the need for adjustments like offsetting the pulley sets so the piece would fully rotate, and not be stopped by the line that was pulling it. Results of this modelling are viewable in the images below, and the video clip attached.



Examples of Model Constructed on 3rd March 2018

Risk Assessments

Most, if not all, of the risks presented by the rigging of this effect are covered in the generic risk assessments for fit ups, overhead work, loading and unloading of counterweight sets, operating of counterweight sets, and grid work - with all of these forming part of this documentation. In addition to these, the operation of the cue itself comes with hazards that are assessed in the effect specific risk assessment, also attached. The risk assessments cover the rigging of the effect, and assume that the flats have already been loaded into the venue from outside.

Final Thoughts

- As no height measurements were provided for the flats, the assumption was made - for the purposes of devising backside rigging and kit lists - that they would be 6m tall. If the fabricated pieces ended up being smaller, the effect would still work, with the side booms being greater in length, and the angles from which the lines left the bar changing to accommodate the lower points they would run to. These lines would also likely have to be black instead of hemp - for aesthetic purposes - which may incur extra cost.
- The flats were also assumed to be wooden, as these are the most often used kind on the Ath stage for this kind of set. However, if the pieces were steel framed, all support could be rigged from the top of the flat rather than having to run up from flying irons. This means the centre point could be rigged on a swivel doughty and bolt, without the need for steels or stropping from the base of the piece - reducing costs for the TSM department by removing the need for some of our purchases. Therefore, if construction budget allowed, this would be the preferable way of constructing the flats.

SET BUILD METHOD STATEMENT

Royal Conservatoire of Scotland

Dance
Drama
Music
Production
Screen

Production	Upward Spin White Card Assignment		
Description of Activity	Rigging of US and SL and SR flats, in such a way that they are able to spin 90 degrees when flown		
Location of Activity	Royal Conservatoire of Scotland, New Athanaeum Theatre, G2 3DB		
Dates of Activity	n/a		
Associated Documents	Risk Assessments/Safe Systems of Work, Equipment Lists		
		Name	**Job Title**
Students Involved	1	Jamie McQueen	Technical Stage Manager
	2	As required	Stage Technicians
Tools / equipment			
All lifting equipment should be detailed separately with safe workng loads	Hand tools - quads and spanners		
Specific hazards identified			
	Manual Handling		
	Overhead work		
	Loading, Unloading, and Operation of Counterwieight Sets		
Specific training requirements			
	Only personel trained in correct Manual Handling techniques and practices in accordance to Royal Conservatoires Manual Handling policy will be able to carry out lifts		
	Only personel trained in correct Working at Height techniques and practices in accordance to Royal Conservatoires Work at Height policy shall be able to carry out task at height		
	Only personel trained and deemed competent shall be authorised to use manual flying system		
Principal elements of set			
Please specify principal elements of scenery that will form the set to be assembled on stage	Item and Description		Approx weight in KG
	1	1 x Back Wall Flat	TBD
	2	2 x Side Flat	TBD
	Sequence of operations		**Equipment Required**
	1	The loft blocks for Bar 15 will be moved 50mm US of current position	Quads, spanners
	2	Loft and head blocks will be positioned US and DS of Bar 11 - as per ground plan - and hemp lines fed to ground and flys	
	3	Side flats will be brought onstage and laid on their face, top side facing DS	
	4	All flying accessories will be added to the back of piece	Irons, Strops, Shackles, Steels, Turnbuckles

Please specify method of work in chronological order detailing tools, materials and equipment used	5	Bar will be brought in, and pulleys attached at pre-determined points for hemp lines. Bar extensions will be fitted if required.	Quads, spanners
	6	Flat will be attached to bar from centre point strop, and hemp run through bar pulleys and tied to eye screws on top corners of flats	Barrel clamps, pulleys
	7	Bar will be weighted and flown out, tension taken up on the appropirate hemp lines to keep the piece parallel to the setting line, and bar will be gridded.	
	8	Back flat will be brought in and fitted with flying accessories	Irons, Shackles, Steels, Turnbuckles, Barrel Clamps
	9	Bar will be flown in, piece attached, weighted and flown to grid.	Quads, spanners
		.	
Temporary support measures used (if required)			
Method of access and egress to the work area		Personel access will be via the Athaneum stage doors (USL, DSL,DSR) Scenery and equipment will be loaded in via the Athaneum dock door, off SL	
Fall protection measures (if required)		No work at height shall be carried out near any exposed edges or holes	
		Hazardous substances	
Involved - Yes / No ?		No	
If Yes please include relevant COSHH data sheets where applicable		N/A	
		PPE required	
Types	1	Steel Toe Cap Boots	
	2	Hardhats	
Nearest first aider		Venue Specific First Aider	
Nearest first aid box		Venue Specific First Aid Box	
Author		Jamie McQueen	
Job Title		Technical Stage Manager	
Date		04/03/2018	
Staff supervisor			
Reviewed by			
Job Title			
Date			

Royal Conservatoire of Scotland — Dance, Drama, Music, Production, Screen	**Risk Assessment Form** ASSESSMENTS TO BE COMPLETED BEFORE STARTING NEW ACTIVITES/TASKS		
Task/Activity/Area: Upward Spin	**Persons At Risk:** Anyone Working at Stage Level, Flypeople	**Ref**: US01	**Initial Assessment Date**: 4th March 2018
Department: Production	Risk Assessment **WITHOUT** Controls: **VERY HIGH**	Risk Assessment **WITH** Controls: **MEDIUM**	**Last Assessment Date**: 4th March 2018
Site/Location: New Athaneum Theatre	**Assessor**: Jamie McQueen **Signature:**		**Reviewed By**: **Signature:**

Hazard *Something with the potential to cause harm*	**Consequence** *The effect of that harm*	**Without Control Measures** **Ri (L x C)**	**Control Measures**	**With Control Measures** **Ri (L x C)**
Personell struck by flat as it rotates	Concussion, Fractures	3 x 4 = 12	Company and crew will be shown which areas of the stage are affected by the swing of the flats, and instructed not to walk within them during thecue. The Technical Stage Manager and any other technicians on the deck will guard these areas during the execution of the cue, to ensure no accidental access.	1 x 4 = 4
Striking of lighting fixtures as flats fly in or out	Physical Injury, Concussion, Electric Shock, Death	3 x 5 = 15	All lighting fixtures will be fitted with safety bonds so that, should they be struck, they will not fall. The lines keeping the flat paralell to the settings line during flight will be kept taught and cleated off when bar reaches high trim, to ensure flat will not rotate in the air.	1 x 5 = 5
FURTHER ACTIONS/MEASURES REQUIRED		**Target Date:**	**Responsible Person:**	**Completion Date:**

Royal Conservatoire of Scotland — Dance, Drama, Music, Production, Screen	**Risk Assessment Form** ASSESSMENTS TO BE COMPLETED BEFORE STARTING NEW ACTIVITES/TASKS		
Task/Activity/Area: Working on Grid With No Panels Removed	**Persons At Risk:** Anyone Working at Stage Level	**Ref**: US02	**Initial Assessment Date**: 16th September 2016
Department: Production	Risk Assessment **WITHOUT** Controls: **VERY HIGH**	Risk Assessment **WITH** Controls: **HIGH**	**Last Assessment Date**: 16th September 2016
Site/Location: New Athaneum Theatre	**Assessor**: Malcolm Stephen **Signature:**		**Reviewed By**: **Signature:**

Hazard *Something with the potential to cause harm*	**Consequence** *The effect of that harm*	**Without Control Measures** **Ri (L x C)**	**Control Measures**	**With Control Measures** **Ri (L x C)**
Falling objects.	Concussion, Fratures, Death	4 x 5	An orange flashing light will be turned on to indicate that overhead work is taking place. Hard hats will be worn when the orange light is flashing. Persons doing grid work will remove all loose items and empty all pockets before ascending to gird level. Tools will be kept on lanyards in the grid area. All grid work will be carried out by competent people or under supervision by an appropriate staff member.	2 x 5
Manual handling. Repositioning automation spreader beams and divert pulleys.	Physical Injury, Fractures, Death	3 x 3	All participating people have attended RCS manual handling awareness training. Spreader beams to be moved with no less than four people and are to be slid, rather than lifted unless a lift is absolutely necessary. Automation pulleys to be carried by no less than two people.	1 x 3
FURTHER ACTIONS/MEASURES REQUIRED		**Target Date:**	**Responsible Person:**	**Completion Date:**

Restrict access to stage using passcode or kaba pass? Tensile barriers to cordon off areas/stage? Buy lanyards for grid work.	04/09/2017	M. Stephen	
Grid currently being damaged by the sliding of the automation spreader beams. Suggest replacing grid panels with something more practical for all works.	04/09/2017	M. Stephen	

Take Ownership - Be Accountable - Get Involved - Communicate - Collaborate

I confirm that the significant findings of the assessments in this file have been communicated to me and the control measures explained. I

Employee Name	Employee Signature	Date

RCS Production Safe Systems of Work

Royal Conservatoire of Scotland

Dance
Drama
Music
Producti
Screen

Generic Grid Work

Hazards

Falling objects. Incorrect Manual Handling.

Required equipment

Safety footwear. Hard Hats.

Operational Procedure

This Operation Should Only Be Caried Out By Trained, Competent People

Before Ascending

1. Ensure the fire alarm system in the grid has been isolate if it is safe to do so.
2. Each person should empty all pockets and remove all loose items.
3. The orange flashing light to indicate overhead work should be switched on and clear instruction given to ground staff that grid work is to take place. At this point all ground staff should wear hard hats.
4. If appropriate areas of the floor space should be sectioned off or access to stage restricted whilst work is taking place.

During work

1. All tools that can fall thorugh the grid should be attached to an appropriate lanyard.
2. If loose items like bolts, screw or shackles are needed, they should be stored in an appropriate container. A rigging mat should be spread where the items are to be used to avoid them falling through the grid. The area below work should be kept clear.
3. Only items that are to be used should be taken onto the grid area.

After work is complete

1. All unused items of equipment and tools should be removed from the grid area.
2. Clear communicaiton to ground staff that the grid is clear should be given only when all equipment, tools and people are off the grid area.
3. The overhead work light can then be switched off provided that there is no other overhead work taking place.

It is forbidden for anyone under the influence of drugs, alcohol or reaction impairing medication to engage in work activities anywhere on Stage level, Grid or Fly Floors.

Royal Conservatoire of Scotland — Dance, Drama, Music, Production, Screen

Risk Assessment Form ASSESSMENTS TO BE COMPLETED BEFORE STARTING NEW ACTIVITES/TASKS

Task/Activity/Area: Fit Up	**Persons At Risk:** Students, Staff	**Ref**: US03	**Initial Assessment Date**: 25th September 2015
Department: Production	Risk Assessment **WITHOUT** Controls: **VERY HIGH**	Risk Assessment **WITH** Controls: **HIGH**	**Last Assessment Date**: 25th September 2015
Site/Location: New Athaneum Theatre	**Assessor**: Simon Cook, Matt Doolan & Malcolm Stephen **Signature:**		**Reviewed By**: **Signature:**

Hazard *Something with the potential to cause harm*	**Consequence** *The effect of that harm*	**Without Control Measures** **Ri (L x C)**	**Control Measures**	**With Control Measures** **Ri (L x C)**
Incorrect lifting techniques or inadequate staffing	Muscle Damage	4 x 4 = 16	SSOW, MH Trained Competent personel	2 x 2 = 4
Falling objects while working at height	Fractures, Death	4 x 5 = 20	SSOW, WaH Trained Competent personel, PPE, Tool belts, Hard Hats, Flashing Orange Light	2 x 4 = 8
Manual handling / working at height	Physical Injury, Fractures, Death	4 x 5 = 20	SSOW, WaH Trained Competent Personel	1 x 5 = 5
Un-controlled movement of laid off scenerey	Physical Injury, Fractures, Death	5 x 4 = 20	SSOW, MH Trained Competent personel	1 x 4 = 4
Obstructions on the floor increasing likelihood of trips	Fractures, Bruising	4 x 3 = 12	SSOW, get-in route has clear paths, good house keeping	1 x 3 = 3
Poor lighting in venue & get in leading to an increased risk of trip hazard	Fractures, Bruising	3 x 3 = 9	Additional lighting as required	1 x 3 = 3
Manual handling of heavy or unusually weighted elements of scenery or equipnment	Fractures, Bruising, Crushing	3 x 3 = 9	TSM/Senior Carpenter to co-ordinate, SSOW, PPE	2 x 3 = 6
FURTHER ACTIONS/MEASURES REQUIRED		**Target Date:**	**Responsible Person:**	**Completion Date:**

RCS Workshops Safe Systems of Work

Generic Scenery installation into a venue

Royal Conservatoire of Scotland

Dance
Drama
Music
Production
Screen

Entertainment Information Sheet No 6 (Revision 1)

Hazards	Required equipment
Incorrect lifting techniques or inadequate staffing	Safety shoes
Falling objects while working at height	Inspection lamps or working lights
Manual handling/ work at height	Tool belts
Un-controlled movement of laid off scenerey	Hard hats (when overhead work is taking place)
Obstructions on the floor	Orange Flashing Light (to signify overhead work is taking place)
Poor lighting in venue & get in	
Manual handling of heavy or unusually weighted elements of scenery or equipnment	

Operational Procedure

This operation must only carried out by trained, competent personel & with staff supervison

Overhead work defined as any situation where personnel are at risk of being struck by items coming from above

General

1. Tie back long hair
2. remove all items of loose clothing & jewellery
3. Wear safety shoes

Venue Set Up

1. Ensure stage and dock has clear paths and adequate lay off space for incoming set.
2. Ensure there is sufficient lighting
3. Turn on orange light if overhead is taking place

During install

1. Lifting/flying operations should be only called by a designated compentent persons (usually the TSM)
2. Each manual handling lift of scenery should be planned and clearly communicated to the people involved in the lift.
3. Use working platforms when working at height where possible/ practical. Use ladders if necessary and always foot ladders when in use. Ground staff to wear hard hats.
4. Ensure laid off scenery/materials are resting at an appropriate angle to prevent slipping or falling. Keep laid off pack depth to a minimum.
5. Ensure there are adequate number of available trained people to move heavy objects.
6. Ensure set is appropriately fixed (stable) before leaving unattended

When Finished

1. return any equipment not being used
2. secure any scenery, materials etc that are being stored
3. tidy back the stage and dock
4. When overhead work complete orange flashing light can be switched off and hard hats removed. TSM/Staff discretion

It is forbidden for anyone under the influence of drugs, alcohol or reaction impairing medication to engage in work activities anywhere on Stage level, Grid or Fly Floors.

Royal Conservatoire of Scotland — Dance, Drama, Music, Production, Screen

Risk Assessment Form ASSESSMENTS TO BE COMPLETED BEFORE STARTING NEW ACTIVITES/TASKS

Task/Activity/Area: Overhead Work	**Persons At Risk:** Anyone Working at Stage Level, Staff, Students	**Ref**: US04	**Initial Assessment Date**: 6th October 2016
Department: Production	Risk Assessment **WITHOUT** Controls: **VERY HIGH**	Risk Assessment **WITH** Controls: **MEDIUM**	**Last Assessment Date**: 6th October 2016
Site/Location: New Athaneum Theatre	**Assessor**: Malcolm Stephen **Signature:**		**Reviewed By**: **Signature:**

Hazard *Something with the potential to cause harm*	**Consequence** *The effect of that harm*	**Without Control Measures** **Ri (L x C)**	**Control Measures**	**With Control Measures** **Ri (L x C)**
Falling objects.	Concussion, Fratures, Death	4 x 5	An orange flashing light will be turned on to indicate that overhead work is taking place. Hard hats will be worn when the orange light is flashing. Personnel doing grid work will remove all loose items and empty all pockets before ascending. Tools to be used overhead will be kept on lanyards. All work will be carried out by competent people or under supervision by an appropriate staff member.	2 x 5
People being stuck by flying bars or flown scenery.	Concussion, Fratures, Death	4 x 5	Stage access limited to only those working there at the time. Everyone made aware of bars in motion with clear vocalisation. Bars are watched in by an appointed floor manager who is in clear communication with the fly person. Orange flashing light to be switched on when flying outside of technical rehearsals and performance and when on hard hats will be required to be worn.	1 x 4
FURTHER ACTIONS/MEASURES REQUIRED		**Target Date:**	**Responsible Person:**	**Completion Date:**

RCS Workshops Safe Systems of Work

Generic Overhead Work

Royal Conservatoire of Scotland

Dance
Drama
Music
Production
Screen

Hazards	Required equipment
Falling objects while working at height	Safety shoes
Manual handling/ work at height	Tool Lanyards
Poor lighting in venue	Hard hats (when overhead work is taking place)
	Orange Flashing Light (to signify overhead work is taking place)

Operational Procedure

This operation must only carried out by trained, competent personel & with staff supervison

Overhead work defined as any situation where personnel are at risk of being struck by items coming from above

General

1. When overhead work is taking place the orange flashing light must be switched on and everyone onstage made aware that the space has become a hard hat area.
2. Personnel must wear safety shoes.

Personnel undertaking overhead work

1. Personnel WaH must secure tools on a lanyard.
2. Personnel WaH must remove all loose items.
3. Those WaH but still at risk from items coming from above must wear hard hats with a chin strap.

Personnel working below any overhead work

1. When overhead work is about take place the orange light will flash. Hard hats must be put on at this point.
2. Hard hats must be kept on for the duration of the overhead work.
3. When the work is completed the light may be switched off if the designated floor manager or staff member deems it safe.
4. Only once the light is off and the floor manager or staff member has deemed it safe to may hard hats be removed.

When Finished

1. Those WaH to return RCS tool lanyards to designated place.
2. Hard hats to be returned to their storage point, not left lying.

It is forbidden for anyone under the influence of drugs, alcohol or reaction impairing medication to engage in work activities anywhere on Stage level, Grid or Fly Floors.

Royal Conservatoire of Scotland — Dance, Drama, Music, Production, Screen	**Risk Assessment Form** ASSESSMENTS TO BE COMPLETED BEFORE STARTING NEW ACTIVITES/TASKS		
Task/Activity/Area: Operation of Counterweight Sets	**Persons At Risk:** Operators. Technicians. Cast. Anyone else in the stage area, fly floors or grid.	**Ref**: US05	**Initial Assessment Date**: 16th September 2016
Department: Production	Risk Assessment **WITHOUT** Controls: **VERY HIGH**	Risk Assessment **WITH** Controls: **MEDIUM**	**Last Assessment Date**: 16th September 2016
Site/Location: New Athaneum Theatre	**Assessor**: Malcolm Stephen **Signature:**		**Reviewed By**: **Signature:**

Hazard *Something with the potential to cause harm*	**Consequence** *The effect of that harm*	**Without Control Measures** **Ri (L x C)**	**Control Measures**	**With Control Measures** **Ri (L x C)**
People being stuck by flying bars or flown scenery.	Concussion, Fratures, Death	4 x 5	Stage access limited to only those working there at the time. Everyone made aware of bars in motion with clear vocalisation. Bars are watched in by an appointed person who is in clear communication with the fly person. Orange flashing light to be switched on when flying outside of technical rehearsals and performance and when on hard hats will be required to be worn. Performers will be fully rehearsed under controlled conditions so they are aware of any loads flown near them. Clearly marked deads will be applied to each bar that is in use to avoid overflying.	1 x 5
Operator struck by cradle whilst in motion.	Concussion, Fratures	3 x 3	Operators to be trained properly and made fully aware of the cradle travel. Head and arms to be kept out of the travel zone when the cradle is in motion.	1 x 3

Falling items due to failure of equipment, accessories or load structure.	Concussion, Fratures, Death	2 x 5	System is fully checked every 12 months by a qualified independent body. Flying accessories are checked every 6 months. Individual bars and terminations are examined visually every time a load is to be attached to them. All faults are reported upon discovery and either resolved or the equipment taken out of use until it can be repaired.	1 x 5
FURTHER ACTIONS/MEASURES REQUIRED		**Target Date:**	**Responsible Person:**	**Completion Date:**
Restrict access to stage using passcode or kaba pass? Tensile barriers to cordon off areas/stage? Lights obstructing the flymans view of the cradles and rope should be removed and repositioned to a more appropriate location so that deads can be easily seen as the travel down the rope.		04/09/2017	M. Stephen	

Take Ownership - Be Accountable - Get Involved - Communicate - Collaborate

I confirm that the significant findings of the assessments in this file have been communicated to me and the control measures explained. I understand the legal

Employee Name	Employee Signature	Date

RCS Production Safe Systems of Work

Royal Conservatoire of Scotland

Dance
Drama
Music
Production
Screen

Generic Counterweight Flying

Hazards

Being struck by flying bars, cradles or loads. Equipment failure.

Required equipment

Safety footwear & Hard Hats during construction phase.

Operational Procedure

This Operation Should Only Be Caried Out By Trained, Competent People

1. Before moving a bar, the bars travel must be check to ensure it is clear.
2. An appointed floor manager must be present if the bar or load is to travel below fly floor level.
3. Once it is deemed safe a bar can be move. Whilst keeping a firm grip of the rope the brake may be slowly released to test that the load is in balance. If it is not, the brake should be applied alog with a rope lock till the bar is weighted correctly.
4. The brake can then be released allowing the in weight bar to travel. A clear shout denoting the bar number and direction of travel should be given prior to the bar moving. E.g. If bar 2 is to be moved upwards, the operator would shout "Bar 2 going OUT". For a bar moving inwards it would be "coming IN".
5. If a bar has a long way to travel till i.e from the grid to stage level, then a second shout may be required as the bar passes the fly floor to ensure people are still aware of the bars movement.
6. During technical rehearsals and shows, bars should be spotted in by a floor manager where there is a danger of cast or crew being struck by flying items.

It is forbidden for anyone under the influence of drugs, alcohol or reaction impairing medication to engage in work activities anywhere on Stage level, Grid or Fly Floors.

Royal Conservatoire of Scotland — Dance, Drama, Music, Production, Screen	**Risk Assessment Form** ASSESSMENTS TO BE COMPLETED BEFORE STARTING NEW ACTIVITES/TASKS		
Task/Activity/Area: Loading and Unloading of Counterweight Sets	**Persons At Risk:** Anyone at stage level. Peformers, technicians and staff.	**Ref**: US06	**Initial Assessment Date**: 15th April 2016
Department: Production	Risk Assessment **WITHOUT** Controls: **VERY HIGH**	Risk Assessment **WITH** Controls: **MEDIUM**	**Last Assessment Date**: 15th April 2016
Site/Location: New Athaneum Theatre	**Assessor**: Malcolm Stephen **Signature:**		**Reviewed By**: **Signature:**

Hazard *Something with the potential to cause harm*	**Consequence** *The effect of that harm*	**Without Control Measures** **Ri (L x C)**	**Control Measures**	**With Control Measures** **Ri (L x C)**
People being stuck by flying bars or flown scenery during the build or rigging phase.	Concussion, Fratures, Death	4 x 4	Stage access limited to only those working there at the time. Everyone made aware of bars in motion with clear vocalisation. Bars are watched in by an appointed person who is in clear communication with the fly person. Orange flashing light will be on when flying outside of technical rehearsals and performance and when on hard hats will be required to be worn.	2 x 4
Manual handling. Counterweight loading.	Muscle Strain, Brusing, Fractures	3 x 3	All participating people must have attended RCS Manual Handling awareness training. A requirement of two persons loading to ensure the minimum amount of lifting and twisting occurs. Counterweights are loaded one at a time. Safety shoes worn by all.	1 x 3

Manual handling. Moving scenery or lighting/sound equipment into position for rigging onto counterweight bar.	Muscle Strain, Brusing, Fractures	3 x 3	All participating people must have attended RCS Manual Handling awareness training. The weight of all items shouldbe known prior to moving them. An appropriate amount of people used to manouvre the item into position. Route of travel must be clear of all trip hazards. Clear communication must be maintained.	1 x 3
Weights being dropped from loading galleries or fly floor whilst loading/unloading.	Concussion, Fratures, Death	2 x 5	Loaders of counterweight are trained in the SSOW for the procedure. Cages are installed below flyfloor level to prevent weights falling onto stage. Fly crew not to stand directly below the cradle when it's being loaded.	1 x 5
Runaway Bars due to incorrect or early counterweighting.	Concussion, Fratures, Death	3 x 5	Accurate weights of loadings known and given to the flyman in advance of the operation. Load is applied to the bar first before counterweight is applied to the cradle.	1 x 5
Falling items due to failure of equipment, accessories or load structure.	Concussion, Fratures, Death	3 x 5	System is fully checked every 12 months by a qualified independent body. All accessories checked every 6 months by the same body. Individual bars, terminations and accessories to be examined visually every time a load is to be attached to them. All loads to be built and maintained to the appropriate standard and visually checked before being flown. Loads must not exceed UDL or point load ratings of the flying system or flying accessories. Flying accessories must be used in accordance with manufacturing guidlines.	1 x 5

FURTHER ACTIONS/MEASURES REQUIRED	**Target Date:**	**Responsible Person:**	**Completion Date:**
Restrict access to stage using passcode or kaba pass? Tensile barriers to cordon off areas/stage?	12/09/2017	M. Stephen	

Take Ownership - Be Accountable - Get Involved - Communicate - Collaborate

I confirm that the significant findings of the assessments in this file have been communicated to me and the control measures explained. I understand the legal

Employee Name	**Employee Signature**	**Date**

RCS Production Safe Systems of Work

Royal Conservatoire of Scotland

Dance
Drama
Music
Productio
Screen

Rigging flown scenery on a Counterweight

Hazards

Being struck by flying bars or scenery. Falling weights from loading gallery. Incorrect manual handling of weights or loads. Runaway bars. Falling loads.

Required equipment

Safety footwear. Hard Hats. Rope lock.

Operational Procedure

This Operation Should Only Be Caried Out By Trained, Competent People

1. Personnel must include 1 floor manager, 1 fly person on flyfloor and 2 persons to unload cradle. A member of staff must be present in the venue.
2. An orange flashing light will be switched on during this procedure and Hard Hats & Safety shoes must be worn by all onstage.
3. The floor manager will instruct the fly person that the stage is clear to bring bar in until it is at a suitable height for attachment of scenic item. The floor manager watches at all times and gives clear vocal instructions to the fly person as the bar approaches the floor. Walkie Talkies should be used where possible.
4. When the bar is at rigging position the flyperson applies the brake and applies a rope clip. Once this is done the flyperson will inform the floor manager that they may proceed with the task.
5. The floor manager may then instruct the attachment of the scenic item, checking all equipment, attachments and fixing points.
6. Once the scenic item is attached and checked, the floor manager will request to the flyperson a specific number of weights to be loaded into the cradle. The flyman will pass this information to the Loading Gallery confirming the number or weights and cradle number. Stage crew may be required to maintain downward force on the bar to act as a counterweight against the loaded cradle either manually or by ropes slung over the bar depending on total weight of the scenic item.
7. Once the cradle is loaded the loading gallery will inform the flyperson that the cradle is loaded confirming the cradle number and number of weights. The flyperson will pass the information to the Floor Manager confirming the cradle number and number or weights.
8. The floor manager will then instruct the flyperson to remove the brake and clip and fly the bar. Again the crew may be required to act as counterweight until the weight of the scenic item is fully hanging on the bar. This will be the decision of the floor manager.
9. Once the scenic item is hanging on the bar the flyperson will adjust the weights if required i.e. add or remove a couple of weights at the flyfloor to ensure that the counterweight set is “balanced”.
10. Once the bar is balanced the flyperson will inform the floor manager who will then instruct further work plan.

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