

WESTREX 5035 FILM CARRIER

OPERATION AND INSTALLATION MANUAL

WESTREX

5035 Film Carrier

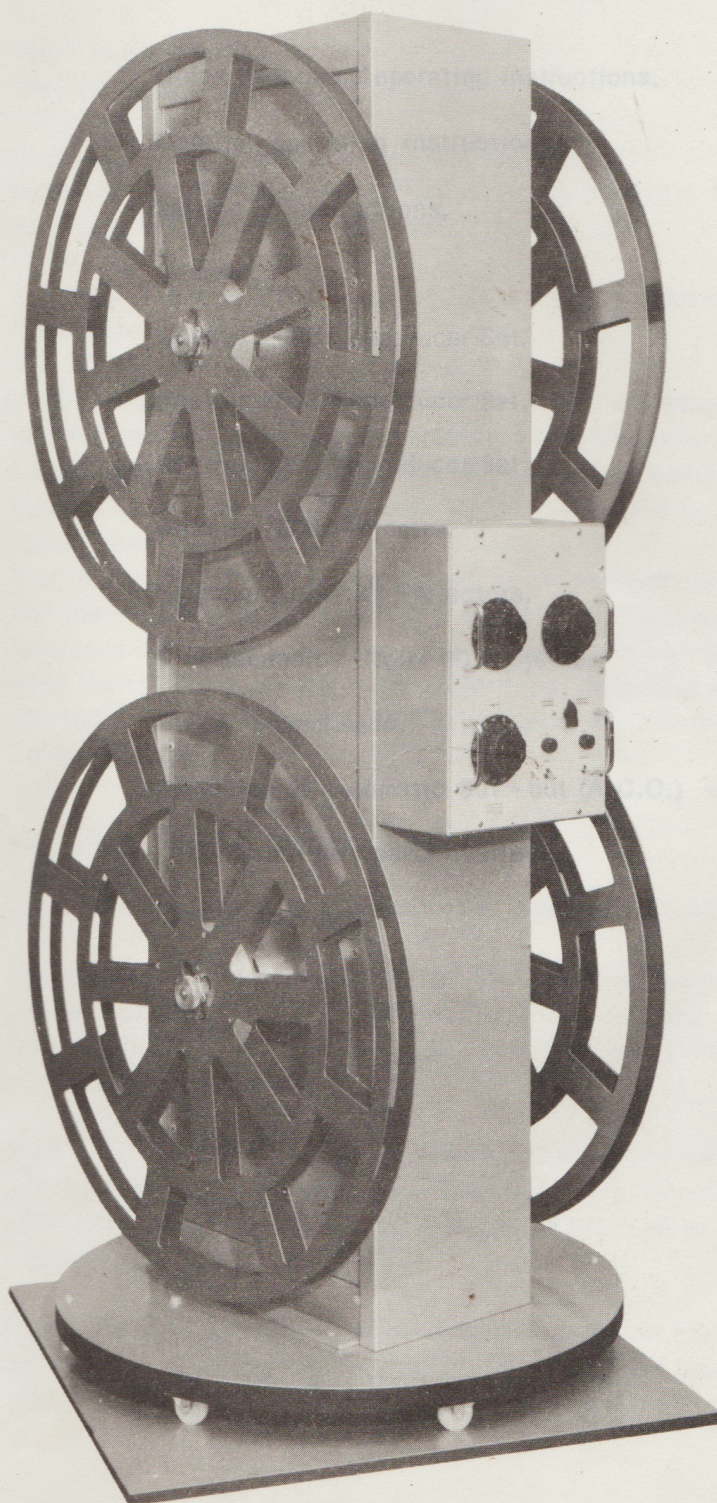
**Operation and
Installation
Manual**



WESTREX 5035 FILM CARRIER

OPERATION AND INSTALLATION MANUAL

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MANUAL VICTOR 5035 FILM CARRIER 9394 CONTROL

OPERATION AND INSTALLATION MANUAL

Section 1.0

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1.0.1 'Run' Power switch off
 1.0.2 'Pay Off' and 'Take Up' controls set
 1.0.3 Lace up film on to projector and film carrier
 1.0.4 Switch on 'Run' control to 80 - 100
 1.0.5 Set 'Take Up' control to 120 - 140
 1.0.6 The film is now under tension and in the READY position for starting the
 1.0.7 Projector.

1.0.8 If the projector is to be used for a long time, limits 4-5 seconds, a setting for
 the film carrier take-up motor Variac can be established which will not
 require readjustment. A normal spool of, say, 12
 thousand feet (an absolutely full spool) may require an increase in tension
 for the last 1000 feet.

1.0.9 The torque of the motor is proportional to the voltage applied
 and the capacity of the phase-shift capacitors. These are not close
 tolerance components. Thus, a precise setting for the Variac can not be given, but
 80-100 is a good starting point for a 12000 foot spool, and 120-140 is normal for a
 Take-up spool.

1.0.10 Rewind for a new scene
 1.0.11 Lace film on to projector spools, leaving no loop or slack between
 1.0.12 Set 'Rewind' control to midpoint at 130. Switch on rewind power, and turn
 the control steadily anti-clockwise to control the speed of rewinding the
 film. As the spool fills up the speed of rewind will slow down, requiring
 re-adjustment of the control.

1.0.13 Should it be required to reverse the normal rewind process - that is to wind
 film back on to the lower spool - then the control should be turned clockwise,
 after first re-setting the control to midpoint 130, and the spools have
 ceased rotating.

1.0.14 Under either of the above modes of operation adjust the rewind control
 slowly, and do not at any time switch off the rewind power, without first
 reducing the speed of rewinding until the spools cease rotating.

MANUAL VERSION WITH LS 9394 CONTROL

QUICK REFERENCE OPERATING INSTRUCTIONS

Section 1.0

Run Mode Procedure For Setting Up Before Start

- 1.0.1 'Run' Power switch off
'Pay Off' and 'Take Up' controls at 0
- 1.0.2 Lace up film on to projector and film carrier
Switch on to 'Run' and set pay off control to 80 – 100
Set 'Take Up' control to 120 – 140
- 1.0.3 The film is now under tension and in the READY position for starting the Projector.
- 1.0.4 If the projector run-up time is within the limits 4-6 seconds, a setting for the film carrier take-up motor Variac can be established which will not require readjustment during the length of a normal spool of, say, 11 or 12 thousand feet. (An absolutely full spool may require an increase in tension for the last 2000' or so).
The torque output of the motors used, is proportional to the voltage applied and the capacity of the phase-shift capacitors. These are not close - tolerance components, and the nominally 240 volt mains supply may vary over wide limits. Thus, a precise setting for the Variacs cannot be given, but 80-100 is normal for the Pay-off spool, and 120-140 is normal for the Take-up spool.

Rewind Mode Procedure

- 1.0.5 Lace film on to upper and lower spools, leaving no loop or slack between.
- 1.0.6 Set 'Rewind' control to midpoint at 130. Switch on rewind power, and turn the control steadily anti-clockwise to control the speed of rewinding the film. As the spool fills up the speed of rewind will slow down, requiring re-adjustment of the control.
- 1.0.7 Should it be required to reverse the normal rewind process— that is to wind film back on to the lower spool — then the control should be turned clockwise, after first re-setting the control to midpoint 130, and the spools have ceased rotating.
- 1.0.8 Under either of the above modes of operation adjust the rewind control slowly, and do not at any time switch off the rewind power, without first reducing the speed of rewinding until the spools cease rotating.

Section 2.0

- 2.0.1 The Westrex 5035 Film Carrier Assembly provides capacity for 2 x 13,500 ft. film programmes with the ability to re-wind one programme at the same time as the other is being projected. Its spools revolve upon sealed bearing spindle assemblies which require no maintenance and are belt driven by Torque motors of a well proven type used for many years in Westrex recording systems. The torque produced by these motors is proportional to the voltage applied and for a given voltage is virtually constant over a wide speed range. Thus film tension between the Film Carrier and the Projector can be quickly and simply adjusted by varying the voltage applied to the Torque motor. The Film Carrier Assembly is normally positioned behind the projector, but if space is restricted it may be fitted at either side of the projector. Stops are fitted to its turntable to limit rotation to 180 degrees.
- 2.0.2 The Film Carrier Control Box contains 3 Variacs which serve to vary the voltage applied to the Torque motors. Once the correct setting for the Pay-off and Take-up Variacs has been established they will rarely if ever need re-adjustment. The rewind Variac controls the rewind rate and enables the film direction to be reversed to facilitate examination. A change over switch selects either the front or rear pair of spools as the running pair; while film is being projected, film on the spools on the other side may be re-wound. The Control Box can be mounted upon either the Film Carrier itself, on the projector pedestal or upon the front wall of the operating box, as convenient.
- 2.0.3 The Westrex Film Carrier is suitable for use with almost any modern projector provided that its run-up time is within the limits of 4 to 6 seconds. Westrex projectors are now fitted with 6000' spool arms and the spools will also fit on the Film Carrier. 6 x 6000' spools, 6 x 13,500' spools and 1 x 3,000' split spool are normally supplied, together with a tape splicer and a rewinder which will accept up to 6000' spools.

MAKING UP THE PROGRAMME

- 2.0.4 The double feature programme is obviously best divided between the two sides of the Film Carrier as running order considerations direct. The single feature programme of 2½ hours or less duration may be made up on one side only. Alternatively, the Feature Film alone may be made up on the Film Carrier, while Shorts, Trailers and Adverts are made up on a 6000' spool carried on the Projector. In this case, to avoid long intervals, the running time on the 6000' Spool should be long enough to cover the rewind time on the feature on the Carrier. It takes about 15 to 20 minutes to rewind 2½ hours film on the Carrier. A long feature film with an intermission is best divided between the two sides of the Carrier.
- 2.0.5 The method employed to transfer film from their transit tins to the Film Carrier spools will depend to some extent upon operator preference, and, perhaps, time

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- 2.0.14 available. Films can be placed on to the split spool on the Film Carrier and run directly onto a large spool, but it is much better practise to hand wind the
- 2.0.15 film from the split spool to a 6000' spool, carefully examining and repairing the film as necessary. The 6000' spool is then placed on the upper or lower
- 2.0.16 spindle of the Film Carrier (depending upon whether the film is start out or end out) and run onto a large spool. Assuming that this is the chosen method and that film is to be loaded into the spools on the front of the Film Carrier proceed as follows:-
- 2.0.17
- 2.0.18 Rotate upper spool by hand to take up slack film; when film is taut slowly
- 2.0.6 Place the loaded 6000' spool and the empty 13,500' spool on the spindles on the front of the Film Carrier and secure.
- 2.0.19 (NOTE: Front is the side with WESTREX nameplate on top). slowly
- 2.0.19 The film should leave the loaded spool and enter the empty spool the same way round and in the same direction as it does on the projector.
- 2.0.20 Check the film from Pay-off to Take-up, and inch the projector down a few
- 2.0.7 Ensure that the "Rewind" switch is off, i.e. down.
- 2.0.8 Select "Rewind Front" position of changeover switch.
- 2.0.9 Set Rewind Variac approximately mid-way.
- 2.0.21 Start the projector in the usual way. If the starting rate is controlled by
- 2.0.10 Ensure that there is no slack film between the upper and lower spools.
- 2.0.11 Switch "Rewind" on. The Film will now move slowly from one spool to the other. Moving the rewind variac knob in one direction will cause the speed to increase. Moving the knob in the other direction will cause the spools to stop and then reverse their direction of rotation. Establish a setting which gives the desired direction and speed. DO NOT ATTEMPT TO STOP THE SPOOLS BY HAND. To stop turn the rewind variac knob back past the reverse position; when the spools are stationary switch off the "Rewind" switch. This method will not work if the film has broken or run-off the pay-off spool. In either of these cases switch off and wait for the spools to stop. A few Film Carriers have been supplied with Electro-Magnetic brakes. These are activated when the rewind switch is in the 'OFF' position, and will quickly bring both spools to rest in these circumstances.
- 2.0.22
- 2.0.23 Continue in this manner until the entire programme is on the Film Carrier.

RUNNING THE PROGRAMME

- 2.0.12 Rotate the Film Carrier if necessary so that the selected spool is in line with the projectors film guide rollers.
- 2.0.13 Thread up the projector leading the film over the guide rollers provided and wrap the film leader around the hub of the take-up spool in the usual manner.
- 2.0.24 Stopping the projector at or near the end of a spool presents no problems, but

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- 2.0.14 Ensure that the "Run" switch is off, i.e. down.
- 2.0.15 Select "Run Front" or "Run Rear" as appropriate with changeover switch.
- 2.0.16 Set Pay-off and Take-up variac to zero.
- 2.0.17 Switch "Run" on.
- 2.0.18 Rotate upper spool by hand to take up slack film; when film is taut slowly advance pay off Variac to 80.
- 2.0.19 Rotate lower spool by hand to take up slack film; when film is taut slowly advance take up Variac to 140.
- 2.0.20 Check the film from Pay-off to Take-up, and inch the projector down a few frames by hand. If all is well the projector is now ready to start. Unlike conventional motors the Torque motors may be left stalled indefinitely. The Film Carrier can therefore be switched on and set up at any convenient time prior to the commencement of the programme.
- 2.0.21 Start the projector in the usual way. If the starting rate is controlled by variable resistors or Start/Run switching it is important that these controls be operated in such a manner as will achieve a smooth acceleration to normal running speed in about 5 seconds. If the projector run-up time is less than 4 seconds a loop will develop between the bottom sprocket of the soundhead and the first film guide roller. This is most undesirable and may lead to film damage.
- 2.0.22 The only long term cure is to increase the starting time of the projector. This is best carried out by your Westrex Service Engineer. As a short term palliative measure try either or both of the following:-
Increase the setting of the Take-up variac by increments of 10 to 180.
Increase the diameter of the Take-up spool hub by wrapping around it a few hundred feet of scrap film.
- 2.0.23 When the projector is running check the film tension between the Film Carrier and the projector. A setting of 140 on the take-up Variac may produce a little too much tension, reduce, if necessary to 130 or 120. A setting of 80 on the pay-off Variac may prove insufficient. Increase if necessary to 90 or 100. Continue to check tension at, say half hourly intervals. It is possible to find a setting for both Variacs at which a projector will both start and run the entire length of a 36" spool. Once the settings have been established they should be used in preference to the figures mentioned in these instructions.
- 2.0.24 Stopping the projector at or near the end of a spool presents no problems, but

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Setting Up Instructions

- 2.0.24 the braking effect of the pay-off Torque motor may not be sufficient to bring a fully loaded spool to rest in the projector run down time. Over-run will then occur. If the spool is allowed to gather momentum in the reverse direction the "Snatch" will break the film. In these circumstances restrain the slowly turning spool by hand until the film is once again taut.
- At the end of each spool run the film out of the projector in the usual way, rotate the film carrier, re-thread and rewind in the manner already described and as programme running considerations direct.

STRIPPING OFF THE PROGRAMME

- 2.0.25 Use the split spool on the Film Carrier in the normal way.

MAINTENANCE AND CORRECTION OF FAULTS

- 2.0.26 No operator maintenance is necessary, other than external cleaning. Film guide rollers should, of course, be kept clean and free with the same scrupulous care as the projector itself. Check the alignment of the guide rollers and the positioning of Film Carrier turntable Stop and re-adjust if necessary. Failure of any of the components used in the Film Carrier and its associated Control Box is extremely rare. In the unlikely event of Torque motor failure it is possible to continue the show using one side only of the Film Carrier.
- Failure of one of the Torque motor condensers would probably blow a fuse, and of course, fuses do get tired and fail for no particular reason from time to time. When new, the changeover switches tend to be rather stiff, check that the switch is fully home and hasn't "hung-up" in an intermediate position.
- In the event of trouble consult your Westrex Service Engineer, he will be pleased to help you.
- 3.1.2 The Westrex 205 Reproducer Set features a large heavy flywheel which effectively restrains the run up time of the motor and consequently no special precautions have to be taken, other than to reduce the voltage by transformation. BAF Equipment sometimes include a variable resistor in the motor circuit. This method calls for a degree of skill from the operator who must advance the variable resistor in a manner which will enable the machine to accelerate at the required rate, this works quite well if used correctly.
- 3.1.3

Setting Up Instructions

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- 3.0 The successful operation of the Westrex 5035 Film Carrier Assembly depends upon in the first instance the following minimum requirements.
1. The choice of a suitable filmpath, and the maintenance of the film guide rollers in accurate alignment.
 2. The adjustment of the projector starting rate so as to ensure that film does not leave the projector faster than the take-up spool can accept it.
- 3.1 **General**
- 3.1.1 It should be appreciated that the presentation and rewinding of 13,500 feet of film involves a number of conflicting requirements. The purpose of these instructions is to enable the best balance to be achieved between the said requirements. The information presented here is based on the results of a large number of installations with widely varying projector/sound reproducer sets. A 36" diameter spool when fully loaded with film represents a considerable inertia and any acceleration applied to the spool by means of the film should ideally be progressive and uniform with an optimum time of 4 to 6 seconds to achieve running speed from a standing start.
- 3.1.2 The majority of modern projectors are driven by an induction type motor with either split phase starting windings or a capacitor start. This type of motor is characterised by a very rapid start, typically of the order of 1 to 1½ seconds to reach running speed. Clearly some means has to be found to restrain the acceleration. Two main methods are employed, these are to increase the inertia of the system by means of a suitable flywheel and/or reduce the voltage applied to the motor either by inserted resistance or by transformation. In a few cases recourse has been made to altering the effective capacity of the capacitor in capacitor start motors. These instructions will indicate a useage of all available variations depending upon the particular type of equipment in use. As the 5035 Film Carrier is in many instances an addition to an existing installation and consequently, not all of the forementioned resolutions maybe capable of being applied, it is inevitable that a degree of operator skill is required for the satisfactory operation of the equipment. The following comments apply to a fairly wide range of equipment likely to be encountered, together with an indication of the degree of operator skill required.
- 3.1.3 The Westrex 206 Reproducer Set features a large heavy flywheel which effectively restrains the run up time of the motor and consequently no special precautions have to be taken, other than to reduce the voltage by transformation. BAF Equipment sometimes include a variable resistor in the motor circuit. This method calls for a degree of skill from the operator who must advance the variable resistor in a manner which will enable the machine to accelerate at the required rate, this works quite well if used correctly.

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- 3.1.4 Several manufacturers have used Start/Run switches where the voltage is first applied to the motor through a fixed resistor of suitable value, the resistor being shorted out when the switch is turned to the "Run" position. This method usually requires the switch to be operated at a critical time during the run-up period, and therefore depends for its success upon the skill of the operator. It is not recommended for use with oil bath projectors using spools of more than about 2000' capacity.
- 3.1.5 The WESTREX 2001/2002 PROJECTOR Rep. Set incorporates a relatively heavy flywheel on motor shaft and the projector is not dependant upon temperature for the torque required to drive it.
- 3.1.6 The WESTREX 2003 and 5006 Reproducer Sets do not incorporate a flywheel and consequently have a comparatively rapid start-up, requiring voltage reduction when used with the 5035 Film Carrier. Except in the case of the BAF, the achievement of a constant rate of acceleration depends upon the load being constant, and in practice a load presented by an oil bath projector will vary with the temperature of the oil. In all projectors the load varies depending upon where the mechanism comes to rest, the starting torque required varying by as much as 2 or 3 to 1 from stopping on "pull-down" as compared with other positions of the intermittent unit. These variations are not particularly significant when 2000' (609 metres) spools are being used because in general sufficient power is available to overcome this condition. The provision of ample power however, almost invariably leads to, too rapid a start when used with spools of 5000' (1524 metres) or larger.
- 3.1.7 The WESTREX 7000 Projector is equipped with means of varying the motor voltage and hence the motor torque and so consequently no special provision need be made other than to adjust the motor voltage to balance between consistant starting and too rapid acceleration.
- 3.1.8 The PHILIPS FP7, FP20 and DP75 PROJECTORS all use capacitor run motors. To increase the run up time to an acceptable figure it is necessary to reduce the voltage applied to the motor, and increase the effective capacity in order to maintain a reasonable starting torque. The FP20 and DP75 do not use mains voltage motors, the DP75 for example uses a 95v motor. Satisfactory results are achieved with these projectors by reducing the voltage applied to 60v and increasing the effective capacity by shorting out the resistor in series with the condenser.
- 3.1.9 GAUMONT-KALEE EQUIPMENT TYPE 18, 19 and 21. Two methods can be employed to start Gaumont-Kalee projectors. If the motor control box is of the type which contains an on/off switch and a semi-rotary resistor then the addition of a fixed 6 or 10 ohms in the motor circuit will slow the start acceptably. If however, a start/run switch and fixed resistor is employed these

110 VOLT PEDESTAL SUPPLY.

Section

3.1.0 should be discarded and a Variac substituted. As previously stated, both these
Cont. methods do depend for their success upon being properly operated, and it is
essential that the minimum skill required is always available.

3.1.10 CINEMACANICCA EQUIPMENT, VICTORIA 10. These projectors use three
phase motors and the method employed to reduce the starting acceleration is
to replace the fixed resistors on the Start/run switch with individually adjust-
able (Pre-set) resistors, which are shorted out by timed relays. The rate of
acceleration will be found to be greatly dependant upon the temperature of the
projector lubricating oil, and some care has to be exercised at start-up.

3.1.11 R.C.A. Reproducer Sets which use 240v A.C. motors can be catered for in a
similar manner as for WESTREX 2003 Reproducer Sets.

SPECIAL REQUIREMENTS FOR SPECIFIC EQUIPMENT

3.2 WESTREX 2002 Reproducer Set

3.2.1 The 33074-A transformer should be mounted in the pedestal, or as convenient,
and connected as shown. The run-up time should be adjusted so that 5 seconds
elapse between switching on and the attainment of full speed. The overall
run-up time is controlled by voltage adjustments; the rate of acceleration after
the centrifugal switch has operated is controlled by adjusting the amount of
resistance in the circuit. Since the starting current of the motor is relatively
high - (in the order of 15-20 amps) - the resistance of the wiring and the
characteristics of the transformer will add a significant value to that of the
81942 Resistance assembly, and it may be possible in certain cases to dispense
with the latter.

If the rate of acceleration increases when the centrifugal switch operates reduce
the total resistance. If the rate of acceleration decreases when the centrifugal
switch operates increase the resistance.

After modification the motor will be found to run a great deal cooler, and the
smoother start will prolong gear life.

RUNNING
PRIMARY 2.1 Amp.
SECONDARY 2.6 Amp.

81942 RESISTANCE ASSY.
(3.2 or 10Ω, .6 Ω
BY STRAPPING)
TYPICAL REQUIREMENT
.6 Ω.

See note 1

Note 1. As connected with a 110V supply the
voltage available at terminals 3 and 4
will be 80. If necessary the wire on
terminal 2 may be transferred to terminal
3 and the motor voltage will rise to approx. 90V

2002 REPRODUCER SET
REDUCED SUPPLY VOLTAGE
/50% FILM CARTRIDGE.

WESTREX CO. LTD. LONDON

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110 VOLT PEDESTAL
SUPPLY.

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3.3 WESTREX 2003 Rep. Sets

3.3.1 A standard 240 volt 1/4 h.p. motor is employed, but the motor is derated by means of an auto transformer to some lesser value to meet the requirements of the projector. A starting resistor is employed to ensure a constant rate of acceleration after the operation of the centrifugal switch.

3.3.2 Material required:
96175 Auto-Transformer
53221 Resistor Assembly
33074A (240V) Drive Motor
42051 Drive Pulley

3.3.3 Pick up the 96175 Auto-Transformer within the Pedestal, or elsewhere as convenient. Check the internal connections, check that the standard 240V switch is closed to supply the mains voltage to the terminal of the 96175 Auto-Transformer. This in turn supplies about 130 volts to the motor via the 53221 Resistor assembly which should be set initially to 3 ohms.

3.3.4 Adjust as follows:
To start the run-up from switch on to Full Speed, and listen for the operation of the centrifugal switch. When the switch operates, the motor speed changes from 100 to 150 r.p.m. (approx. 4-5 seconds). (The speed will increase with warmth.)

3.3.5 When the voltage is set to 115V, the run-up time will be about 10 seconds. To increase the rate of acceleration, increase the resistance to increase the rate of acceleration. When the centrifugal switch operates, decrease the resistance to decrease the rate of acceleration when the centrifugal switch operates.

3.3.6 CONVERSION OF 2003 Rep. Sets TO 2002 REPRODUCER SET
FROM START/RUN SWITCH TO SIMPLE ON/OFF SWITCHING
Rearrange the wiring to the 96175 "Start/Run" Switch so that it becomes an "on/off" switch. "On" in the run position only.
The earlier LD102W Auto-Transformer can be used to provide voltages between 110 and 150 as follows, as the transformer is now very considerably under-run.

RUNNING CURRENT
PRIMARY 2.1 Amp.
SECONDARY 2.6 Amp.

33074-A
TRANSFORMER.

1 2 3 4 5 6 7 8 9 10

33074-A

DRIVE
MOTOR.

81942 RESISTANCE ASSY.
(3, 2 or 10HM, .6 OHM
BY STRAPPING)
TYPICAL REQUIREMENT
.6 OHM.

See note 1

APP.

Note 1. As connected with a 110V supply the voltage available at terminals 3 and 4 will be 80. If necessary the wire on terminal 2 may be transferred to terminal 3 and the motor voltage will rise to approx. 90V

ISS.
EAF

DR.
ENG.

2002 REPRODUCER SET
REDUCED SUPPLY/VOLTAGE
/5035 FILM CARRIER.

WESTREX CO. LTD. LONDON

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3.3 **WESTREX 2003 Rep. Sets**

3.3.1 A standard 240 volt ¼ h.p. motor is employed, but the motor is derated by means of an auto transformer to some lesser value to suit the requirements of the projector. A starting resistor is employed, the function of which is to ensure a constant rate of acceleration after the operation of the centrifugal switch.

3.3.2 Material required:

96175	Auto-Transformer
53221	Resistor Assembly
33242A	(240V) Drive Motor
42051	Drive Pulley

3.3.3 Proceed as follows :
Mount the 96175 Auto-Transformer within the Pedestal, or elsewhere as convenient, and the other items in their usual position, check that the 33242A Motor has its internal connections set for 240 volt operation. The standard 30535 Motor switch is used to apply the incoming mains voltage to the appropriate terminal of the 96175 Auto-Transformer. This in turn supplies about 130 volts to the motor via the 53221 Resistor assembly which should be set initially to 6 Ohms.

3.3.4 Adjust as follows :
Time the run-up from switch on to Full Speed, and listen for the operation of the centrifugal switch. Decide if the rate of acceleration changes when the switch operates. The ideal run-up time is 5 seconds, 4-6 seconds being acceptable. (A very cold 2001/2003 should be adjusted to run-up in 6 seconds on the assumption that its acceleration rate will increase with warmth.)

3.3.5 Increase the voltage to decrease the run-up time; decrease the voltage to increase the run-up time. Increase the resistance to increase the rate of acceleration when the centrifugal switch operates; decrease the resistance to decrease the rate of acceleration when the centrifugal switch operates. After adjusting the resistance it will almost certainly be necessary to re-adjust the voltage. It is most important that there should be no step in the acceleration curve, and that extremes of temperature should not cause the run-up time to fall outside the limits stated.

3.3.6 CONVERSION OF 2003 Reproducer Sets USED WITH 5035 FILM CARRIERS FROM START/RUN SWITCHING TO SIMPLE ON/OFF SWITCHING

Rearrange the wiring to the LS 9395 "Start/Run" Switch so that it becomes an "on/off" switch, "on" in the run position only.

The earlier LD10299 (Radiospares) Auto-Transformer can be used to provide voltages between 110 and 150 as follows, as the transformer is now very considerably under-run.

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3.3.6 Cont.

0	120	240					
0	100	110	150	200	220	240	250
0					130	240	
250	240	220	200	150	110	100	0
0						140	240
250	240	220	200	150	110	100	0

Adjust, as described earlier, so that the run-up time is 4-6 seconds and so that there is no step in the acceleration curve.

3.4 **5006 REPRODUCER SETS.**

MODIFICATION TO 33241A CONTROL TO PROVIDE ADJUSTABLE ACCELERATION OF PROJECTOR DRIVE MOTOR

3.4.1 This modification is a necessary preliminary to the use of a 5000 series projector with a 5035 film carrier, and supersedes earlier methods using start/run switching.

3.4.2 Material required: 96175 500 watt auto transformer
48" 3 core PVC flexible 40/0076
4 x 2BA x 1/2" R.H. CD. PL. ST. Screws
4 x 2BA CD. PL. ST. nuts
4 x 2BA CD. PL. ST. washers.
Drawings required: LSR 14240, LSO 15728

3.4.3 Proceed as follows:-

1. Mount 66175 transformer inside 5003 pedestal clear of other units.
2. Remove red wire from top of FS1 and solder to T4 of TS1.
3. Connect 3 core flexible as follows:-

	Transformer end	Control end
Brown	240V	Top of FS1
Green/Yellow	140V	T4 of TS1
Blue	0V	T8 of TS2

4. Set R1 to 6 ohms.

3.4.4 The run-up time should be adjusted so that 4-6 seconds elapse between switching on and the attainment of full speed. The overall run-up time is controlled by voltage adjustments. The rate of acceleration after the centrifugal switch has operated is controlled by the adjustment of R1, (which may be 10, 6, 4 or 2.4 ohms). If the rate of acceleration increases when the centrifugal switch operates reduce the value of R1. If the rate of acceleration decreases when the centrifugal switch operates increase the value of R1. Adjustments to R1 will usually entail readjusting the voltage.

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3.4.5 CONVERSION OF 5000 SERIES PROJECTORS USED WITH 5035 FILM CARRIERS FROM START/RUN DRIVE MOTOR SWITCHING TO SIMPLE ON/OFF SWITCHING

It is assumed that the pedestal is adjusted for 110 volt operation, that a LD 10299 auto transformer has been interposed between the 240 volt mains supply and terminals 1 and 2 of TS2 and that MOD 1479 has been carried out to the 33241A MOD 1390 control.

Material required: 1 x 78605 10 ohm resistor, 2 x LD5196 neon lamps.

Drawings required: LSR 14240, LSO 15728, LS 9558.

3.4.6 Proceed as follows:—

Restore 5003 pedestal to standard, taking care that the exciter supply and change-over power units are adjusted for 240 volt operation and that the neon indicators are of 240 volt type.

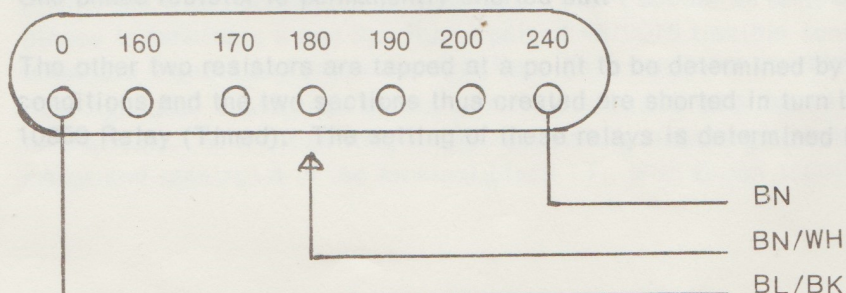
Follow method detailed in 3.3.3 using LD 10299 transformer in lieu of 96175. Note that voltages between 110 and 150 can be obtained as follows as transformer is now very considerably under-run.

	0		120		240			
0	100	110	150	200	220	240	250	
	0				130		240	
250	240	220	200	150	110	100	0	
	0					140	240	
250	240	220	200	150	110	100	0	

3.5 **WESTREX 7000 PROJECTOR**

3.5.1 This Projector is equipped with a Motor Plate assembly which carries a tapped auto transformer for control of voltage to drive motor. The connections are shown below. Final adjustment of the applied voltage can best be determined by experiment as local conditions play some part in the start up time. First manufacture of these machines are equipped with a geared non-flywheel type of motor (Parvalux). Later versions will have a direct drive 6 pole flywheel type of motor (Croydon) with the addition of a semi positive drive to complement the starting characteristics of the motor.

84491 Transformer



Section

3.6 MODIFICATION TO G.K. 21 SERIES EQUIPMENTS TO MAKE SUITABLE FOR USE WITH 5035 FILM CARRIERS

- 3.6.1 Materials required: 78605 10 Ohm Resistor - or -
(see text) 53221 10 Ohm Resistor assembly
32458 Variac
- 3.6.2 Two types of starting arrangements were adopted by Gaumont-Kalea. Early machines have an on/off switch and a semi-rotary start resistor, Late machines have a start/run switch and a fixed resistor.
- 3.6.3 With early type machines the addition of a fixed resistor of 6 or 10 Ohms will be all that is required to ensure that a suitable starting rate can be achieved. A Westrex 78605 Resistor is suitable.
- 3.6.4 With late type machines the start/run switch and its associated resistor should be discarded and a Westrex 32458 Variac and a 53221 Resistor assembly substituted. The Variac should be mounted in place of the switch, the resistor assembly must be mounted externally. The output of the variac is taken to the projector drive motor via the 53221 Resistor assembly. The purpose of the resistor is to make linear the rate of acceleration when the centrifugal switch operates, and it is vital that its value should be correctly chosen. Wind-up the variac smoothly over the desired run-up time (5 seconds). If the rate of acceleration decreases when the centrifugal switch operates more resistance is needed. If the rate of acceleration increases less resistance is needed. 6 Ohms is usually a suitable value.

3.7 **CINEMACANICCA**

- 3.7.1 The three phase delta connected motors in this equipment have pre-set adjustable resistances in each phase which are shorted by a Start-Run switch.
- 3.7.2 In order to get a more controlled uniform acceleration the following changes are made:
- 3.7.3 The Run-Start switch is replaced by a M.E.M. 25 ALC Contactor assembly operated by a LS 9598 Det. 2 Push Button.
- 3.7.4 One phase resistor is permanently shorted out.
- 3.7.5 The other two resistors are tapped at a point to be determined by running conditions and the two sections thus created are shorted in turn by two LD 10850 Relay (Timed). The setting of these relays is determined by experiment

Section

- 3.7.5 but initially relay A should be set for 2 seconds and relay B for 4 seconds. These relays should be housed in a 9 x 6 x 3 conduit box (LSD 40908).

3.7.6 Stocklist (per machine)

Item	Quantity	Description
1	1	M.E.M. 25 ALC Contactor
2	1	LS 9598 Det, 2 Push Button
3	2	LD 10850 Relay
4	2	LD 10920 Relay Base
5	1	LSD 40908 Box

3.8 MODIFICATION TO R.C.A. SOUNDHEADS TO MAKE THEM SUITABLE FOR USE WITH WESTREX 5035 FILM CARRIERS.

- 3.8.1 The only R.C.A. Soundheads suitable for use with Westrex 5035 Film Carriers are those fitted with 240 volt drive motors. They will give satisfactory results if connected in the same way as Westrex 2003 Reproducer Sets.

Material required: 96175 Auto Transformer
53221 Resistor Assembly

- 3.8.2 A variety of pedestals have been used to support these soundheads, thus precise mounting instructions cannot be given. Follow generally the method detailed for the 2003 Reproducer set.

Section

4.0 ADDITION OF ACO2 ALARM SYSTEM TO 5000 SERIES PROJECTOR USED WITH 5035 FILM CARRIER

- 4.1.1 The ACO2 alarm unit together with its associated CU4 contactor should be mounted on the rear of the pedestal, a bushed 1" hole between the alarm system and the inside of the pedestal will suffice for wiring. Modify the CU4 contactor before mounting, referring to sketch of connections packed with contactor:

- 4.1.2 Remove and discard brown wire between T1 and end of fuseholder. Remove brown wire from T6 and solder on to end of fuseholder. Remove blue wire from T2 and solder on to T6.

- 4.1.2 Terminals 1 and 4 are now relay contacts, terminals 2 and 3 are linked together, terminal 5 is coil live, terminal 6 is coil neutral.

- 4.1.3 (The operator should be instructed that in the unlikely event of the contactor failing the wires connected to terminals 1 and 4 should be removed and replaced in terminals 2 and 3). Run a pair of 40/0076 flexible conductors between terminals 1 and 4 and the xenon rectifier. With contactor operated rectifiers, Westinghouse, T & R, and similar, connect in series with the safety interlock loop circuit. With Orcon RPS-X-25B rectifiers connect in lieu of link between mains and terminal 4 of the terminal block 1T. With Orcon 1000B lamphouses

Section

- 4.1.3 connect in series with the supply to the lamphouse. Run a 40/0076 between terminal 2 of the ACO2 and terminal 6 of the CU4 and terminal 2 of TS2 (Projector Pedestal Control Neutral). Remove the incoming 240v pedestal supply from terminal 1 of TS2 and connect to terminals 1 and 3 of the ACO2. Run a 40/0076 between terminal 1 of TS2 and terminal 4 of the ACO2.
- 4.1.4 Modify the LS9394 film carrier control box in accordance with LSO 17370, and run a pair of 40/0076 flexible conductors between terminals 4 and 5, TB1 and terminals 5 and 6 of the ACO2 alarm unit. With the ACO2 switched "Out" the projector, xenon lamp and film carrier should now all function as before.
- 4.1.5 Mount the LDR cell on the operating side of the shuttercase, immediately below the window, and mount the tacho roller block in place of the lower guide roller assembly. Mount the 2724 connection box on the front pedestal by means of 3/4" conduit bush. Using twisted 14/0076 or similar connect the LDR cell to ACO2 terminals 13 and 14. The braid of the tacho roller co-ax should be connected to ACO2 terminal 16 and the inner terminal 15.
- 4.1.6 Where a low level non sync (5022B or similar) has been supplied, looking into what normally would be the No. 2 machine photo input of the 5009A amplifiers connect ACO2 terminals 10, 11 and 12 as follows. Run a pair of 14/0076 flexibles between ACO2 terminals 10 and 11 and the unused "push to make" pair of contacts on the pedestal mounted disc/film changover push button (Refer to LSO 15728), removing the link to the amplifier changeover relay. Run a pair of 14/0076 flexibles between ACO2 terminals 10 and 12 and the unused "push to break" pair of contacts on the amplifier mounted LD 8800 film/disc changover push button. Run a green 40/0076 earth wire to ACO2 terminal 14.
- 4.1.7 Where a high level non sync (5022A or similar) has been supplied, connected into the 5009A amplifier via the "auxiliary" key. Connect ACO2 terminals 9, 10, 11 and 12 to the corresponding numbered terminals of the Image Electronics "manual override" control box (which may be mounted in any convenient position) with 14/0076 conductors. Ensure the link "B" is inserted in the ACO2 p.c. board, remove R1 and insert wire link in its place, change R2 to 180 ohms, connect 40/0076 earth wire to ACO2 terminal 9, remove green wire from lower pillar on right hand side of P.E. board and solder to upper pillar (24-ve).
- 4.1.8 It is the electrical contractors responsibility to supply suitable alarm bells and a battery which should be connected to ACO2 terminals 7 and 8.
- 4.1.9 The system should then be tested as follows
- 4.1.10 The control settings are usually quite uncritical, and if set to the mid position should accommodate most installations. Nevertheless it is obviously desirable to ensure and demonstrate that the alarm will not operate unless the light falls below the controllable minimum, or the film speed is reduced by more than 50%.

Section

- 4.1.10 This can best be achieved by the method which follows:-
Cont.
- 4.1.11 Switch S1 (see Image Electronics Drawing No. 2721-1) to the "Out" position.
- 4.1.12 Withdraw RLA C. from the octal socket. (This is the right hand relay of the
4.1.21 two Perspex covered plug in relays).
- 4.1.13 Connect a D.C. 1-100 milli-amp meter by inserting Negative prod into pin
socket No. 1, and Positive prod to pin socket No. 4, of octal base of RLA C.
- 4.1.14 Lace up film switch S1 "In", strike lamp, project onto screen in normal way.
4.1.22 On certain projectors time can be saved by driving the roller with a rubber-band.
If the rubber-band is put on the land of a sprocket to a land of the roller, the
exact running speed is obtained without film in the projector.
- 4.1.15 Observe that meter reads about 50 mA until the projector reaches normal running
speed and /or dowser is opened and then drops to zero. The reed relay contacts
have now closed. If ACO2 is maladjusted the reed relay will not operate and a
reading will continue to be shown on the meter.
- 4.1.16 Set light level control fully clockwise. Reduce xenon light output to minimum,
observe that meter is not reading. (See note "a") Rotate light level control
anti-clockwise until meter reads. Then rotate slowly clockwise until meter
does not read. This control is now set. Restore xenon light level to normal.
- 4.1.17 Rotate Tacho' speed control fully anti-clockwise. Improvise friction pad on
motor (see note "b") and slow projector about 50%. Meter should now read.
(see note "c"). Rotate control slowly clockwise until meter does not read,
bearing in mind the time delay in this circuit. This control is now set. Remove
restraint on motor.
- 4.1.18 Replace Relay C. System should now function correctly.
- 4.1.19 NOTE: (a) If meter reads, light falling upon LDR is insufficient or LDR
is defective. Reposition or replace.
(b) Only practical where drive motor is operating with reduced
input voltage, i.e. Westrex 2003, 5006 or similar. On GK
Equipments motor can usually be slowed with a starting re-
sistor or Variac.
(c) Component tolerances on certain equipment prevent reed relay
contacts opening until tacho-roller is stopped, even if control
is fully anti-clockwise. Replace R4 with 4.3 Kohm ½ watt
close tolerance resistor.

Section

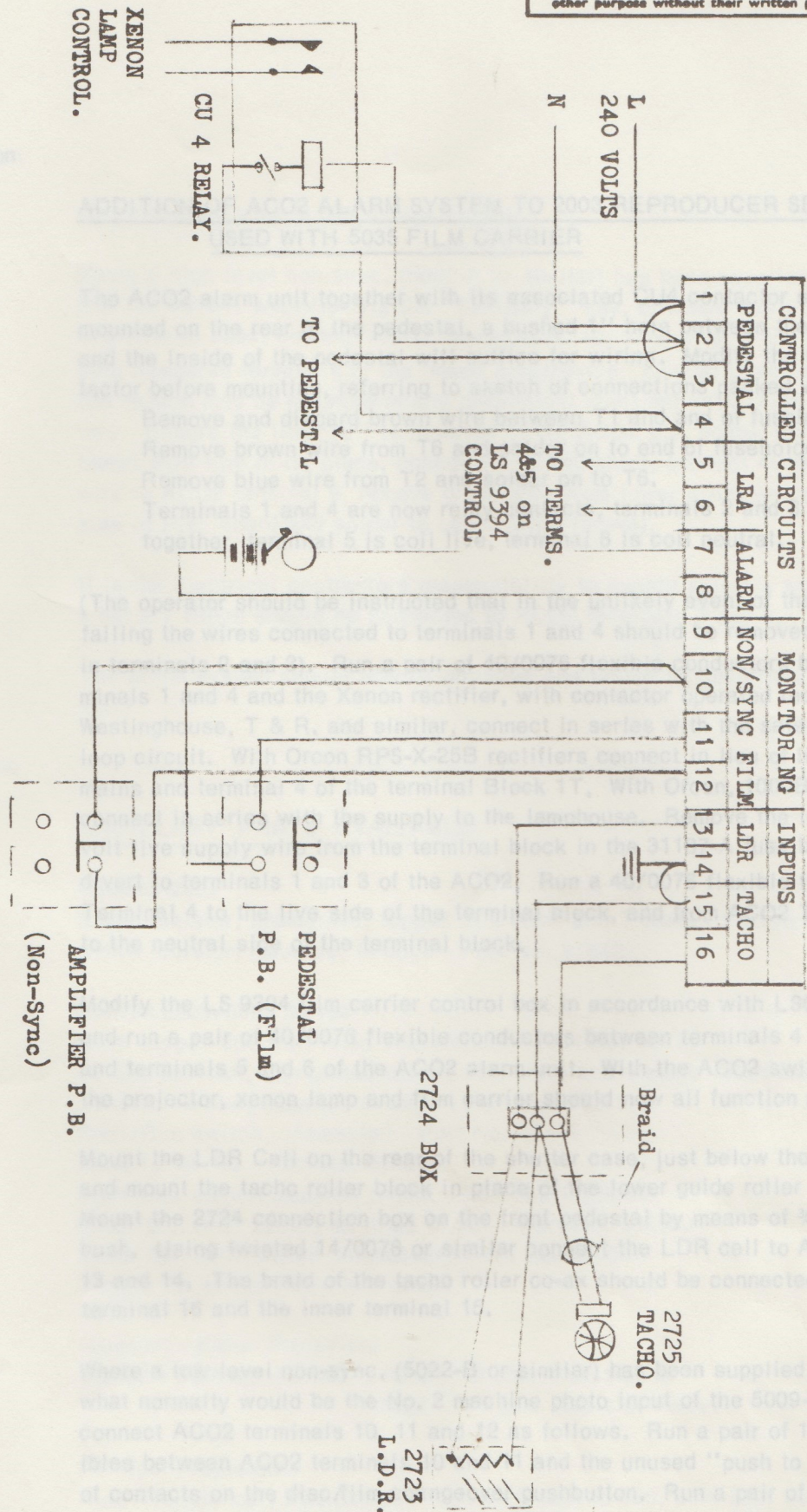
- 4.1.20 Installation in areas of low main voltage, or where additional illuminated push buttons have been fitted can benefit from a change in resistor values, and in the interest of standardisation it has been decided that all units should be modified as follows:- Remove R1 and substitute wire link. Replace R2 with 180 ohm $\frac{1}{2}$ watt resistor.
- 4.1.21 ACO2/G1 "MANUAL OVERRIDE" CONTROL BOX
This unit must be fitted whenever an ACO2/G1 alarm unit is to be added to any system which does not use a single projector with Westrex 5009 amplifier and low level non sync. With these systems push buttons are provided to change from disc to film and vice-versa; the same push buttons also serve to activate or de-activate the alarm unit.
- 4.1.22 The "Manual override" control box contains two illuminated push buttons which enable the alarm unit to be activated or de-activated at will. On switching on the alarm unit the red push button will light. When the machine is running correctly the alarm unit can be activated by pressing the green push button, which will then light. Before stopping the projector or closing the dowsers the alarm unit must be de-activated by pressing the red push button, which will extinguish the green light.
- 4.1.23 In the event of a fault condition occurring while the alarm unit is activated the projector, arc rectifier, and film carrier mains supplies will be removed, and the alarm bells will ring. To cancel the alarm switch off projector, arc rectifier and film carrier and then press the red push button. (Note particularly that the alarm must be cancelled by pressing the red push button after switching off the projector, arc rectifier and film carrier). The fault should then be corrected and the projector restarted in the usual way.

NOTE If a high level Non-Sync (5022-A) is used a separate P.B.Box (Manual Override) is supplied. Ground connection is then made to T.9 (See text)

A.C.O. 20.1
5000 Projector 18
5009 Amplifier
5035 Film Carrier.

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P.



NOTE If a high level Non-Sync (5022-A) is used a separate P.B.Box (Manual Override) is supplied. Ground connection is then made to T.9 (See text)

A.C.O. 2G.1
5000 Projector/
5009 Amplifier/
5035 Film Carrier.

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P.

APP.

SS1

Section

4.2 ADDITION OF ACO2 ALARM SYSTEM TO 2003 REPRODUCER SET (240 volt)
USED WITH 5035 FILM CARRIER

4.2.1 The ACO2 alarm unit together with its associated CU4 contactor should be mounted on the rear of the pedestal, a bushed 1" hole between the alarm system and the inside of the pedestal will suffice for wiring. Modify the CU4 contactor before mounting, referring to sketch of connections packed with contactor:
Remove and discard brown wire between T1 and and of fuseholder.
Remove brown wire from T6 and solder on to end of fuseholder.
Remove blue wire from T2 and solder on to T6.
Terminals 1 and 4 are now relay contacts, terminals 2 and 3 are linked together, terminal 5 is coil live, terminal 6 is coil neutral.

4.2.3 (The operator should be instructed that in the unlikely event of the contactor failing the wires connected to terminals 1 and 4 should be removed and replaced in terminals 2 and 3). Run a pair of 40/0076 flexible conductors between terminals 1 and 4 and the Xenon rectifier, with contactor operated rectifiers, Westinghouse, T & R, and similar, connect in series with the safety interlock loop circuit. With Orcon RPS-X-25B rectifiers connect in lieu of link between mains and terminal 4 of the terminal Block 1T, With Orcon, 1000B lamphouses connect in series with the supply to the lamphouse. Remove the incoming 240 volt live supply wire from the terminal block in the 31107-A fuse box, and divert to terminals 1 and 3 of the ACO2. Run a 40/0076 flexible from ACO2 Terminal 4 to the live side of the terminal block, and from ACO2 Terminal 2 to the neutral side of the terminal block.

4.2.4 Modify the LS 9394 film carrier control box in accordance with LSO 17370, and run a pair of 40/0076 flexible conductors between terminals 4 and 5, TB1 and terminals 5 and 6 of the ACO2 alarm unit. With the ACO2 switched "Out" the projector, xenon lamp and film carrier should now all function as before.

4.2.5 Mount the LDR Cell on the rear of the shutter case, just below the light cone, and mount the tacho roller block in place of the lower guide roller assembly. Mount the 2724 connection box on the front pedestal by means of 3/4" conduit bush. Using twisted 14/0076 or similar connect the LDR cell to ACO terminals 13 and 14. The braid of the tacho roller co-ax should be connected to ACO2 terminal 16 and the inner terminal 15.

4.2.6 Where a low level non-sync. (5022-B or similar) has been supplied, looking into what normally would be the No. 2 machine photo input of the 5009-A amplifiers connect ACO2 terminals 10, 11 and 12 as follows. Run a pair of 14/0076 flexibles between ACO2 terminals 10 and 11 and the unused "push to make" pair of contacts on the disc/film changeover pushbutton. Run a pair of 14/0076 flexibles between ACO2 terminals 10 and 12 and the unused "push to break" pair of contacts on the 7008-A film/disc changeover pushbutton. run a green

Section

4.2.6 40/0076 earth wire to ACO2 terminal 14.

4.2.7 Where a high level non-sync. (5022-A or similar) has been supplied, connected into the 5009-A amplifier via the "auxiliary" key, or where any other type of amplifier is used, connect ACO2 terminals 9, 10, 11 and 12 to the corresponding numbered terminals of the Image Electronics "manual override" control box (which may be mounted in any convenient position) with 14/0076 conductors. Ensure the link "B" is inserted in the ACO2 p.c. board, remove R1 and insert wire link in its place, change R2 to 180 ohms, connect 40/0076 earth wire to ACO2 terminal 9, remove green wire from lower pillar on right hand side of P.E. board and solder to upper pillar (24-ve).

4.2.8 It is the electrical contractors responsibility to supply suitable alarm bells and a battery which should be connected to ACO2 terminals 7 and 8.

4.2.9 The alarm system should now be adjusted and tested as described in section 4.1.9

Section

5.0 ANCILLARY PARTS AVAILABLE

5.1.1 Westrex 2002

3 ohm resistor, unmounted, tapped at 2 ohms and 1 ohms - Part No. 75988
3 ohm resistor, mounted, in cage - Part No. 81942

5.1.2 Westrex 2003/5000 Series

Multi tapped 500 watt Auto Transformer - Part No. 96175
10 ohm resistor, unmounted tapped at 6 ohms and 4 ohms - Part No. 78605
10 ohm resistor, mounted in cage - Part No. 53211
Start/Run switch, unmounted - Part No. 42445
Knob for above - Part No. 55498
Start/Run switch mounted in box - Part No. LS 9395
Motor ON/OFF switch mounted in box - Part No. 30535J
Motor ON/OFF switch unmounted - Part No. 69800
Toggle for above - Part No. 69802

5.1.3 Gaumont - Kalee Projectors

Variac - Part No. 32458A 78605 10 ohm Resistor or
53211 10 ohm Resistor Assy.

5.1.4 Philips Projectors

Auto Transformer, Radiospares 1000 watt tapped 250, 240, 220, 200, 150, 110, 100, and 0 (can be used when suitably derated on lower voltage)
Part No. LD 10299

Section

6.0

LIST OF DRAWINGS

<u>Number</u>	<u>Title</u>	
LSR 17590	5035 Film Carrier	Assembly and Stocklist
P 17351	33442-E Carrier	Stocklist
LSO 17352	„ „	Assembly
LSR 17707	„ „	Wiring
P 17331	Motor Panel	Stocklist
LSO 17332	„ „	Assembly
LSL 17333	„ „	Wiring
P 16974	LS 9394 Control	Stocklist
LSX 16975	„ „	Assembly
LSR 16976	„ „	Wiring
LSL 16979	„ „	Schematic
LSO 17706	Film Carrier H Control - Interconnections	
P 17599	Start Box	Stocklist
LSL 17600	„ „	Assembly
LSL 17921	„ „	Wiring

