

# MINI LOADER

## THEORY GUIDE

**TGJ** - 3211/3212

Miniloaders with Serial Numbers

1162 - 1216



KODAK LIMITED  
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## Machines with serial number 1162 to 1216

### Changes *to the cycle*

TIMER T14 and RELAY KM added to provide the time necessary between FILMS for the slowed down PROCESSORS and the AOT cycle.

TIMER T13 and RELAY K13 added to provide the pause for the first air injection to try to ensure the FILM is not on the UPPER SCREEN.

RELAY **KFC1 E** added and CONTACT on line **119** corrected from **KFC1 D-I** to **KFC1 E-I**.

DIODES on lines 140 to 142 reversed to correct drawing error.

RELAYS KRO and KRP added to provide a more accurate method of detecting the presence of FILM in the **CASSETTE** after the **CASSETTE LID** has been opened and MS3 operates.

### **NORMAL SEQUENCE**

Inserting a **CASSETTE** with the LATCH first and uppermost interrupts PHOTOCELL FC2. With the machine in the home position, MICROSWITCH MS1 is energized. The interruption of PHOTOCELL FC2 energizes the CONVEYOR BELT MOTOR forward.

The CONVEYOR BELT carries the **CASSETTE** to the END STOP where it is detected by PHOTOCELL FC1 receiving a signal from the REFLECTIVE PATCH on the **CASSETTE LID**.

The signal from PHOTOCELL **FC1** stops the CONVEYOR BELT MOTOR forward With the **CASSETTE** in position at the END STOP. The PHOTOCELL **FC1** signal also starts the CAM MOTOR forward.

The CAM forward motion starts the **CASSETTE** opening cycle. The CLAW releases the **CASSETTE LATCH** and lifts the LID

MICROSWITCH MS5 operates to check that PHOTOCELL FC3 has been interrupted by the **CASSETTE LID**. PHOTOCELL FC3 indicates that the **CASSETTE** has opened.

MICROSWITCH MS17 operates to stop the cam to allow the injector to operate to try to ensure the film is released from the top screen

MICROSWITCH MS3 operates to check the REFLECTIVE PATCH on the UPPER SCREEN to check that a film is not stuck to it. If a film is stuck to the UPPER SCREEN, air is injected in pulses to release it to enable it to drop into its correct position on the LOWER SCREEN.

MICROSWITCH MS8 operates to check PHOTOCELL FC7 to see if a film is jammed in the CHUTE - or - the EXPOSED FILM MAGAZINE is full, according to which model it is. If a FILM is jammed or the MAGAZINE is full the vacuum will be turned off to prevent the EXPOSED FILM being picked up

The CAMS continue to rotate bringing the **CASSETTE** and MAGAZINE SUCKERS down onto the exposed and unexposed films

MICROSWITCH MS2 operates to stop the CAM MOTOR and start TIMERS T4 and T2. TIMER T4 provides time to pick up the exposed and unexposed films and when it times out after 1 second it starts the WHITNEY TILT MECHANISM which rotates the SUCKERS into the tilt position to separate the FILM.

TIMER T2 controls the tilt time between 0 and 7 seconds (adjustable) to allow time for the film to separate. TIMER T2 times out and restarts the CAM MOTOR forward.

MICROSWITCH MS7 operates to check photocell PHOTOCELL **FC1** to see if the exposed film has been picked up from the cassette.

MICROSWITCH MS4 operates to energize the WHITNEY MOTOR to remove the tilt.

MICROSWITCHES MS13 and MS15 de-energize the WHITNEY MOTOR with the SUCKERS in the horizontal position.

**Machines with serial number 1162 to 1216**

**NORMAL SEQUENCE (cont.)**

The CAM MOTOR continues to rotate carrying the films to their respective destinations.

MICROSWITCH MS6 operates to de-energize the SOLENOID VALVES and VACUUM PUMPS to release the exposed and unexposed films into the MAGAZINE or CHUTE and CASSETTE respectively.

MICROSWITCH MS16 operates to check that PHOTOCELL FC1 has detected that an unexposed film has been placed in the CASSETTE correctly.

The CAMS complete the cycle and energize MICROSWITCH MS1.

The CONVEYOR BELT is energized in reverse and the cassette is ejected. The CASSETTE interrupts PHOTOCELL FC2 on the way out which energizes TIMER T6. TIMER T6 times out to de-energize the CONVEYOR BELT and complete the cycle.

**THEORY GUIDE  
NORMAL CYCLE  
Machines with serial number 1162 and higher**

When the cams are in the home position MICROSWITCH MS1 (33) is closed

At power up FC2(30), TIMER T12 (33) and "POWER ON" LAMP (38) [ via MS9,MS10,MS11 AND MS12 ] are energised.

MICROSWITCH MS11 (33) energises RELAYS KR1(33) KR1A (34) and KR1B (35).

KR1-11(36) enables KRM (36).

Timer T12 times out to give electronics time warm up and KT12-1 (36) enables Relay KRM.

KR1B-2 (79) enables CAM reset control.

KR1A-1 (87) opens to inhibit CAM RELAY KC (87).

KR1-2 (43) enables KN, KNA and "CASSETTE ENTERED" LAMP (42-45).

When the operator feeds a CASSETTE:

PHOTOCELL FC2 (30) is interrupted by the CASSETTE and KFC2-1 (36) energises RELAY KRM (36).

KRM-1 (37) holds RELAY KRM (36).

KRM-2 (40) completes the -12 volts line and energises PHOTOCELLS FC1, FC3, FC4, FC5, FC6, FC7 and FC8.

RELAYS KM1 (144), KS (151) and TIMER T7 (145)

RELAYS KN, KNA and "CASSETTE ENTERED" LAMP (42 to 45)

CONTACTS KS-1 (54A) and K5-2 (80) inhibit BELT RETURN and RESET

KM1-1 (5) energises the COMPRESSOR.

TIMER T7 (145) times out after 1 sec. and KT7-1 and KT7-2 (104 -71) open to de-energizes SOLENOID VALVES S1 and S2 closed ( to give COMPRESSOR time to start ).

Contacts KN (15) energise CONVEYOR BELT FORWARD and carry the CASSETTE to the END STOP.

When the CASSETTE arrives at the END STOP it interrupts PHOTOCELL FC1.

PHOTOCELL FC1 (146) sees the reflective patch on the LID of the CASSETTE and energises RELAY KFC1

KFC1-11(51) energises RELAYS KFC1A,KFC1B,KFC1C.KFC1D and KFC1E (51-54).

KFC1 A-1 (52) self holds RELAYS KFC1A etc;  
(2)

KFC1A-2 (43) de-energizes RELAYS KN, KNA. and LAMP (42-45)

Contacts KN (15) de-energise CONVEYOR BELT FORWARD.

KFC1 B-1 (88) energises RELAYS KC and KCA and TIMER T9 ( 87-89 )

Contacts KC (19) energise CAM MOTOR FORWARD.

KCA-2 (87) enables self hold of RELAYS KC, KCA and TIMER T9.

## NORMAL CYCLE (cont)

MICROSWITCH MS1 (33) operates and de-energizes RELAYS KR-1, etc

KR1A-1 (87) closes to maintain RELAY KC, etc energised after TIMER T3 has operated later in the cycle

The CLAW opens the CASSETTE LID which interrupts PHOTOCELL FC3 (147).

PHOTOCELL FC-3 (147) energises RELAY KFC3.

KFC3-1 (96A) energises RELAY KFC3A (96A).

KFC3A-2 (97) self holds RELAY KFC3A (96A).

MICROSWITCH S5 (62) operates to check if CASSETTE LID has opened.

On a normal cycle the lid opens and KFC3A-1 (62) inhibits RELAYS KRX and KRXA (62-63).

The opening cycle continues and MS17 (101A) operates via MS3 and energises RELAY KR13, KL and TIMER T13.

KR13-2 (1018) self holds RELAY KR13 and TIMER T13 (101A-101B).

KR13-1 (87) opens to de-energise RELAYS KC, KCA and TIMER T9.

Contacts KC (19) de-energise the cam to stop the cycle with the cassette lid just open.

KL-2 (103A) energises SOLENOID VALVE SI open via diode to inject air to release the film in case it is stuck to the upper screen.

TIMER T13 (101B) times out and T13-1 (88) closes to re-energise RELAYS KC, KCA and TIMER T9.

Contacts KC (19) restart the CAM forward.

MICROSWITCH MS1 7 (101 A) de-energizes RELAY KL and contact KL-2 (103A) de-energizes SOLENOID VALVE SI to complete the injection of air.

The opening cycle continues and MICROSWITCH MS3 (99A) operates and energises RELAYS KR3, KR3A, KR3B and KR3C (97-99A)

KR3A-1 (98) self holds RELAYS KR3, KR3A and KR3B.

KR3-1 (87) and KR3-2 (88) open to stop CAM.

KR3B-1 (43) inhibits CONVEYOR forward.

KR3C-1 (152) changes over and energises RELAY KRO and the CAPACITOR

The CAPACITOR holds RELAY KRO energised for 0.5 SECS. after MS3 operates when the cam de-energizes it.

KRO-1 (153) enables RELAY KRP.

KRP-1 (109) enables RELAY KF1 and "FILM NOT REMOVED FROM CASSETTE" LAMP to check that there is a FILM in the CASSETTE.

MICROSWITCH MS8 (134) operates to check FC7 to see if there is a FILM jammed in the CHUTE - or - the EXPOSED FILM MAGAZINE is full, according to which version machine it is. On a normal cycle FC7 will see its reflective patch and inhibit RELAYS KFC7 and KFC7A (133 - 134).

PHOTOCELL FC4 checks to see if a FILM is on the UPPER SCREEN.

PHOTOCELL FC4 looks at the REFLECTIVE PATCH on the UPPER SCREEN and with no FILM present on a normal cycle it will see the REFLECTIVE PATCH and energise RELAY KFC4 (148).

## NORMAL CYCLE (cont)

KFCC1 (95) energises RELAYS KFC4A and KFC4B (95-96).

KFC4A-1(96) self holds RELAY KFC4A.

KFC4A-2 (99) energises RELAY KR5.

KR5-1 (100) changes over to self hold RELAY KR-5 (100) and inhibit RELAY KL which prevents the injector cycle operating on a normal cycle.

Note :- TIMER T13 is already held energised in the timed out condition by KR13-2 (101 B).

KR5-2 (105) energises RELAY KT3A

KT3A-1 (106) self holds RELAY KT3A

KT3A-2 (88) maintains the CAM in motion.

MICROSWITCH MS3 operates and de-energizes RELAY KR3C.

KRC3-1 (152) changes over energising RELAY KRP (153) whilst KRO-1 remains closed until 47 Mf discharges de-energizes RELAY KRO

KRP-1 (109) checks cassette has a film in it.

MICROSWITCH MS2 (73) operates and energises KR2. KR2A, KR2B, KR2C, and TIMERS T2 and T4 (73-79).

KR2A-1 (74) self holds RELAYS KR2 etc;

KR2A-1 (87) de-energizes RELAY KC

Contacts KC (19) de-energise the CAM MOTOR to stop the cycle with the CASSETTE and MAGAZINE SUCKERS in contact with the exposed and unexposed FILM in the CASSETTE and MAGAZINE respectively.

Vacuum is applied to pick up the respective FILMS when;

KR2C-2 (119) energises RELAYS KPC and KM2 and SOLENOID VALVE S3 (119-121)

KR2C-1 (122) energises RELAYS KPM and KM3 and SOLENOID VALVE S4 (122-124).

KM2 (6) energises the CASSETTE VACUUM PUMP M2 (6).

KM3 (7) energises the MAGAZINE VACUUM PUMP M3 (7) .

KPM-1 (123) self holds RELAYS KPM and KM3 and SOLENOID VALVE S4 closed.

KPC-1 (120) self holds RELAYS KPC and KM2 and SOLENOID VALVE S3 closed.

TIMER T4 times out after 1 sec. to allow time for the vacuums to build up to pick up the FILMS.

KT4-1 (71) energises RELAY KW (71) via MS14.

Contacts KW (13) energise the WHITNEY TILT MOTOR M5 (13). During the rotation the first cam lifts the FILM clear of the top of the stack before the second cam rotates it into the tilt position where it is stopped by MS1 4 (71) opening.

TIMER T2 times out after 2 secs. and KT2-1 (86) energises RELAYS KC, KCA and TIMER T9 (87-89).

Contacts KC (19) energise the CAM MOTOR M7 (23) forward.

## NORMAL CYCLE (cont)

MICROSWITCH MS7 (92) operates to check PHOTOCELL FC1 to see that the EXPOSED FILM has been picked up from the CASSETTE.

KFC1 C-2 (92) remains open on a normal cycle and inhibits RELAYS KR7 and KR7A and TIMER T8 (92-94).

MICROSWITCH MS-4 (66) operates and energises RELAYS KR4 and KR4A (66-70).

KR4-2 (70) energises RELAY KW.

KR4-1 (70) closes to maintain circuit to RELAY KW (71) via MS1 3 (70).

Contacts KW (13) energise WHITNEY TILT MOTOR M5 to remove the tilt which is then stopped by MS13 (70) opening

The transport mechanism carries the FILMS to their respective destinations.

MICROSWITCH MS6 (118) operates and energises RELAY KR6 (118)

KR6-1 (119) de-energizes RELAYS KM2, KM3, KPC and KPM and SOLENOID VALVES S3 and S4 open (119-124).

KM2 and KM3 (6-7) de-energise the VACUUM PUMPS.

SOLENOID VALVES S3 and S4 vent the vacuum and the FILMS are released.

The exposed FILM is dropped into the RECEIVING MAGAZINE or CHUTE according to which model it is.

The UNEXPOSED FILM is dropped into the CASSETTE.

MICROSWITCH MS16 (112) operates and checks PHOTOCELL FC1 to confirm that a FILM is in the CASSETTE.

Note :- on a normal cycle KFC1B-2 (111) remains open to inhibit RELAY KF2.

The CAM CYCLE is completed and MS1 is energised

MS1 (32) energises RELAYS KR1, KR1A and KR1 B (32-35)

KR1A-1 (87) de-energizes RELAY KC, etc.

Contacts KC (19) de-energise the CAM MOTOR M7.

KR1 B-1 (58) energises RELAYS KNRA, KNRB, KNRC, KNRD and TIMER T5 and enables KNR (56-61).

TIMER T5 times out and KT5-1 (56) energises RELAY KNR

Contacts KNR (17) energise the CONVEYOR BELT REVERSE to carry the CASSETTE back out of the MACHINE.

KNRB-1(56) self holds RELAYS KNR etc;

KNRA-2 (106A) enables RELAYS KA, KM and TIMER T14 (106A-107)

The returning CASSETTE interrupts PHOTOCELL FC2 and energises RELAY KFC2.

KFC2-2 (106A) closes to energise RELAYS KA, KM and TIMER T14 (106A-107).

KA-1 (106B) self holds RELAY KA, etc.

KA-2 (60) energises TIMER T6 (60).

KM-2 (36) opens to inhibit cassette entry on the next cycle.

## NORMAL CYCLE (cont)

T6 times out and opens contact **KT6-1**(36) which de-energizes RELAY KRM.

KRM-2 (41) contact opens to break the - VE line to complete the cycle (6).

TIMER T14 (107) is maintained energised via KM-I, **T14-1** (107) and the memory circuit preventing the machine being energised for the next cycle until it has timed out

TIMER T14 times out and **T14-1** (107) de-energizes RELAY KM

KM-2 (36) closes enabling the next cycle.

## START SERIAL UNLOADING

Pressing the START SERIAL UNLOADING BUTTON S18 energises RELAYS KAOT and KAOTI (115-116)

**KAOT1-1(116)** self holds RELAYS KAOT and KAOTA through **KF1** and **KF2** ( or **KNRD-1** (117) following a failure to load or unload cycle )

KAOT-2 ( in TIMER T6 circuit ) enables TIMER T6

The machine continues the normal cycle of operations after entering the cassette until the CAM reaches the zero position and MS1 I energises the KNR RELAYS through **KR1 B-I** (58)

**KNRB-1** (56) self holds KNR, etc and energises TIMER T6 via KAOT-2 (see TIMERS circuit).

The CONVEYOR reverses and carries the CASSETTE out

TIMER T6 times out as the CASSETTE is passing through PHOTOCELL FC2 and energises RELAY KFC2

**KT6-1** (36) opening ends the cycle with the CASSETTE interrupting PHOTOCELL FC-2.

At the same time **KFC2-2** (106A) closes to energise RELAYS **KA,KM** and TIMER T14 (106A-107).

**KA-1** (106B) self holds RELAY KA, etc.

KM-2 (36) opens to inhibit the next cycle.

TIMER T14 is maintained energised via KM-I. **T14-1** (107) and the memory circuit preventing the next cycle until it has timed out and opened **T14-1** to de-energise RELAY KM and TIMER T14.

TIMER T6 times out closing **KT6-1** to enable RELAY KRM

KM-2 (36) closes to restart the next cycle.

After the last FILM has been unloaded from the cassette PHOTOCELL FC-1 will detect the CASSETTE is empty on the next cycle.

MS7 checks PHOTOCELL FC-1, **KFC1 C-2** (92) remains closed and energises RELAYS **KR7**, **KR7A** and TIMER T8 (92-94).

**KR7-2** (112) energises RELAY **KF2**.

**KF2-2** (116) contact opens to de-energise RELAYS KAOT and KAOTA and end the SERIAL UNLOAD cycles.

## STOP SERIAL UNLOADING

Pressing the STOP SERIAL UNLOADING BUTTON energises RELAY **KG** (138)

**KG-I** (116) de-energizes RELAYS KAOT and KAOT1 (115-116) to allow the machine to return to a normal cycle



## tg/11 CASSETTE EJECT

The CASSETTE RETURN BUTTON (54A) is inhibited during a normal cycle by KS-I (54) and can only be used when RELAY KRM is de-energized.

To eject a CASSETTE press BELT RETURN BUTTON S21 (54) which energizes KNRE, the 4700 mF CAPACITOR, RELAY KNR and "CASSETTE EJECT" LAMP (53 to 56).

The DIODE (56) inhibits RELAYS KNRA etc.

CONTACTS KNR (17) energize the CONVEYOR BELT Reverse until the CAPACITOR discharges de-energizes RELAYS KNRE, KNR and the CASSETTE EJECT LAMP after approx. 2 secs.

Contacts KNR (17) de-energizes the CONVEYOR BELT MOTOR in reverse to stop the CONVEYOR BELT and complete the cycle.

### INCORRECT FEEDING OF CASSETTE

If the CASSETTE is entered incorrectly, PHOTOCELL FC1 does not see the REFLECTOR on the top of the CASSETTE and does not energize RELAY KFC1.

KFC1-1(51) remains open and leaves RELAYS KFC1A, KFC1B, KFC1C, KFC1D and KFC1E de-energized (51-54).

KFC1A-2 (43) remains closed keeping RELAY T1A, TIMER T1 and "CASSETTE ENTERED INCORRECTLY" LAMP energized.

TIMER T1 times out after 4 secs..

KT1-1 (43) de-energizes RELAYS KN, KNA and "CASSETTE ENTERED" LAMP (41-45).

Contacts KN (15) de-energize the CONVEYOR BELT MOTOR M6 forward

KT1-2 (59) energizes the CONVEYOR BELT MOTOR M6 in reverse.

The normal cycle continues until completion.

### DOUBLE THICKNESS ALARM

The normal cycle commences energizing FC8 and CONVEYOR forward.

CONTACT KNA-2 (139) opens to inhibit RELAY KFC8.

A double FILM will take PIN 13 of PHOTOCELL FC8 CHIP TCA 965 LO energizing RELAYS KFC8, KR. "DOUBLE FILM" LAMP and TIMER T11.

KFC8-2 self holds KFC8 and LAMP ON in the MEMORY LINE.

KFC8-1 (139) inhibits RELAY KFC8 (KNA-2 has closed when CONVEYOR forward stopped).

KR-1 (142) self holds RELAY KR and TIMER T11.

KT11-1(143) de-energizes BUZZER when T11 times out.

### CASSETTE FAILED TO OPEN

MS5 (62) operates to check if PHOTOCELL FC3 has seen that the CASSETTE has opened.

If the CASSETTE failed to open PHOTOCELL FC3 will not energize RELAY KFC3.

KFC3-1 (96A) remains open therefore RELAYS KFC3A remains de-energized.

## **CASSETTE FAILED TO OPEN (cont.)**

**KFC3A -1 (62)** energises RELAYS KRX, KRXA and **KT5A (61A-63)**.

KRX-2 (63) **self** holds RELAYS KRX, KRXA and **KT5A**.

**KT5A-2 self** holds RELAY **KT5A**.

KRXA-2 (87) changes over to de-energise RELAY KC and energise RELAY KCR through T10-1.

Contacts KCR (22) energise CAM MOTOR M7 in reverse until it reaches **MS1**.

**MS1** energises **KR1, KR1A** and **KR1B**.

**KR1B (56)** energises RELAYS **KNRA, KNRB, KNRC, KNRD** and **TIMER T5 (61)** and enables RELAY **KNR**.

**KR1A-2 (90)** energises **TIMER T10 (90)**.

**TIMER T10** times out and **KT1 O-I (91)** de-energizes RELAY **KCR**.

**KT10-2 (89)** **self** holds **TIMER T1 0**.

Contacts **KCR (22)** open to de-energise the CAM MOTOR **M7** in reverse

Note:- the timing delay of **T10** ensures that the **CASSETTE OPENER MECHANISM** clears the **CASSETTE LATCH** after **MS1** operates and before the CAM stops in the home position

**TIMER T5** times out after 1 sec.

**KT5-1 (56)** energises RELAY **KNR**

The normal cycle continues to completion.

## **RESET**

The **RESET BUTTON** is inhibited during a **normal** cycle by **KS-2 (80)** and can only be operated when RELAY **KRM** is de-energised.

Pressing **RESET (80)** energises RELAY **KB**, "RESET" LAMP and RELAY **KC** through the **DIODE (80-87)**

**KB-2 (79)** **self** holds RELAY **KB**.

Contacts **KC (19)** energise CAM MOTOR back to home position and energises **MICROSWITCH MS-I** and RELAY **KR1**.

**KR1 B-2 (79)** opens to de-energise CAM MOTOR.

## **EXPOSED FILM ON UPPER SCREEN**

**MS3** checks for FILM on the UPPER SCREEN

**MS3** energises RELAYS **KR3, KR3A, KR3B** and **KR3C**.

**KR3-1** and **KR3-2 (87-88)** de-energise RELAY **KC**.

Contact **KC (19)** de-energise CAM MOTOR **M7**.

**PHOTOCELL FC4** does not see the **UPPER SCREEN REFLECTOR** because it is covered by the **FILM** stuck to the **UPPER SCREEN**.

**PHOTOCELL FC4** does not energise RELAY **KFC4**.

**KFC4-1 (95)** remains closed energising RELAYS **KFC4A** AND **KFC4B (95)**.

**EXPOSED FILM ON UPPER SCREE (cont.)**

KFC4A-1 (96) self holds RELAYS KFC4A, etc.

KFC4-2 (99A) remains open leaving RELAY KR5 de-energised.

KR5-1 (101) energises RELAYS KL, KR13 and TIMERS T13 and T3.

Note :- TIMER T13 has already timed out and is held in this state by KR13-2 (101 B).

Air is injected in pulses controlled by the ON / OFF TIMER CIRCUIT KL which energises SOLENOID VALVE S1 open and closed through contact KL-1 (103) to release the FILM from the UPPER SCREEN during the timing of T3.

Because the FILM failed to drop into its correct place in the cassette immediately so that it could be unloaded KFC4A-2 (122) de-energises SOLENOID VALVE S4 to drop the UNEXPOSED FILM back into the MAGAZINE.

TIMER T3 times out after 6 secs. and energises RELAY KT3A (105).

KT3A-2 (88) energises RELAY KC.

Contacts KC (19) energise CAM MOTOR FORWARD.

The normal cycle resumes to completion.

MAGAZINE NEARLY EMPTY

PHOTOCELL FC5 detects MAGAZINE nearly empty. FC5 energises RELAY KFC5 (128).

KFC5-1 (128) self holds RELAY KFC5, and energises "MAGAZINE NEARLY EMPTY" LAMP, RELAY KR and TIMER T11.

KR-1 (142) self holds RELAY KR and TIMER T11.

KNA-1 (108) holds LAMP on in the memory until the next cycle.

KT11-1 energises BUZZER for the duration of TIMER T11.

MAGAZINE EMPTY

PHOTOCELL FC-6 detects MAGAZINE empty.

FC-6 energises RELAY KFC6 (130).

KFC6-2 (128) inhibits "MAGAZINE NEARLY EMPTY" LAMP.

KFC6-1 (131) self holds RELAY KFC6 and energises "MAGAZINE EMPTY" LAMP, RELAY KR and TIMER T11.

KR-1 (142) self holds RELAY KR and TIMER T11.

KNA-1 (108) holds LAMP on in the memory line until the next cycle.

KT11-1 energises the buzzer for the duration of T11 TIMER.

PHOTOCELL FC-7 detects MAGAZINE FULL / FILM jammed in TUNNEL.

If the MAGAZINE is full or there is a FILM jammed in the TUNNEL then the PHOTOCELL will be blocked and energise RELAYS KFC7 (133).

KFC7-2 (134) enables RELAY KFC7A.

## **EXPOSED FILM MAGAZINE FULL or FILM JAMMED IN TUNNEL(Cont.)**

MICROSWITCH MS-8 **operates to** check **if** the MAGAZINE is full or a **FILM is** jammed in the tunnel.

With a **full** MAGAZINE or FILM jammed in the TUNNEL, RELAYS **KFC7A**, KR, TIMER **T11** and LAMP are energised through **KFC7-2**.

**KFC7A-1** (135) self holds RELAYS **KFC7A** and MAGAZINE FULL or "FILM JAMMED IN TUNNEL" LAMP on.

**KR-1** (142) self holds TIMER **T11** and RELAY KR.

**KFC7A-2** (119) prevents exposed FILM pick up from CASSETTE.

**KT11-1** (143) keeps BUZZER energised for the duration of **T11** TIMER cycle.

FAILURE TO PICK UP EXPOSED FILM FROM CASSETTE

MS-7 operates to check if EXPOSED FILM has been picked up from the CASSETTE.

Because the FILM has remained in the CASSETTE, PHOTOCELL **FC1** cannot see the REFLECTIVE PATCH on the LOWER SCREEN. Therefore contact **KFCIC-2** remains closed.

**KFC1 D-I** (109) changes over and energises RELAY **KF1** and "FILM NOT REMOVED FROM CASSETTE" LAMP.

**KF1-1** (110) **self** holds RELAY **KF1** and LAMP energised via **KNA-I** (108) memory circuit.

**KF1-1** also energises TIMER **T11** and RELAY KR.

**KR-1** (142) **self** holds TIMER **T11** and RELAY KR energised.

**KT11-I** (143) energises BUZZER until TIMER **T11** times out and opens **KT11-1**.

MS7 (92) energises TIMER T8 and RELAYS KR7 and **KR7A** through **KFC1 C-2**.

**KR7A-2** (93) self holds RELAYS KR7 and **KR7A**.

**KR7-1** (87) opens to de-energise RELAY KC (87).

**KR7A-1** (122) opens to de-energise RELAYS KPM and KM3 and SOLENOID VALVE S4 to release vacuum to drop UNEXPOSED FILM back into the MAGAZINE.

Contacts KC (19) stop the CAM to enable the FILM to be dropped back into the MAGAZINE.

**KR7-2** (112) enables RELAY **KF2** and "CASSETTE NOT RELOADED" LAMP.

KM3 (7) de-energizes the VACUUM PUMP.

TIMER T8 (92) times out after 1 second.

**KT8-2** (94) self holds TIMER T8 RELAY (92).

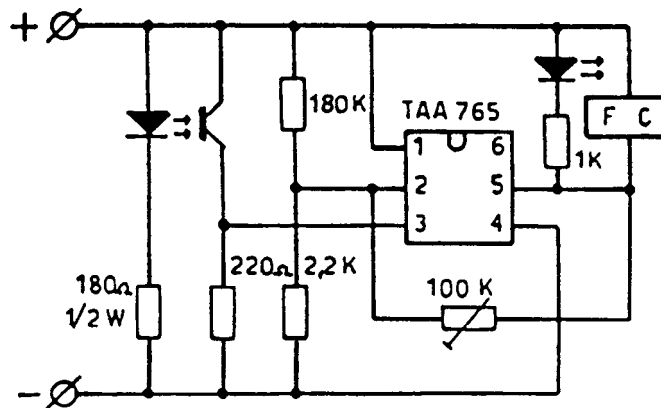
**KT8-1** (86) energises RELAY KC.

Contacts KC (19) restart the CAM to complete the cycle.

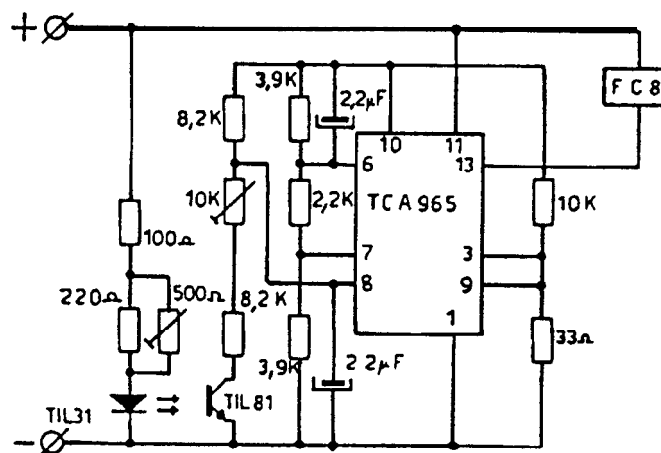
At the end of the cycle MS1 6 (112) operates to check if the CASSETTE has been reloaded and energises RELAY **KF2** and "CASSETTE NOT RELOADED" LAMP through **KR7-2** (112 - 114)

**Machines with serial number 1162 to 1216**

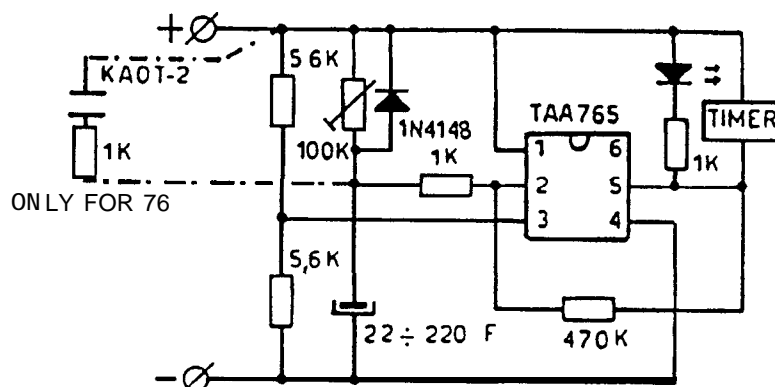
**Theory Guide**  
**Circuit Diagrams**  
**Serial Numbers T01216**



Photoamplifier

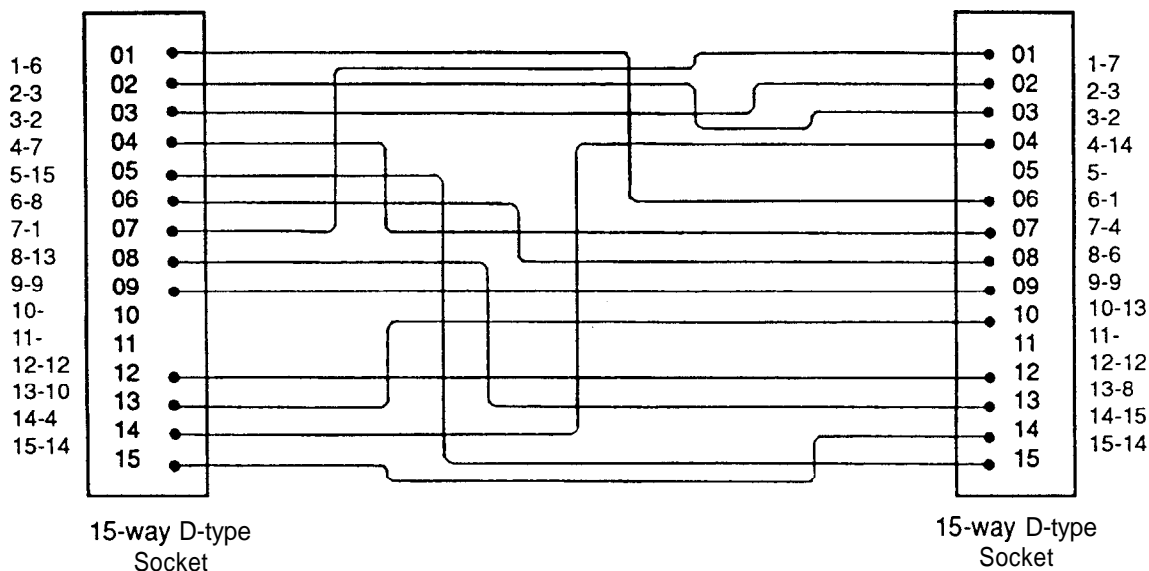


Double film detection



Socket on  
Mother Board

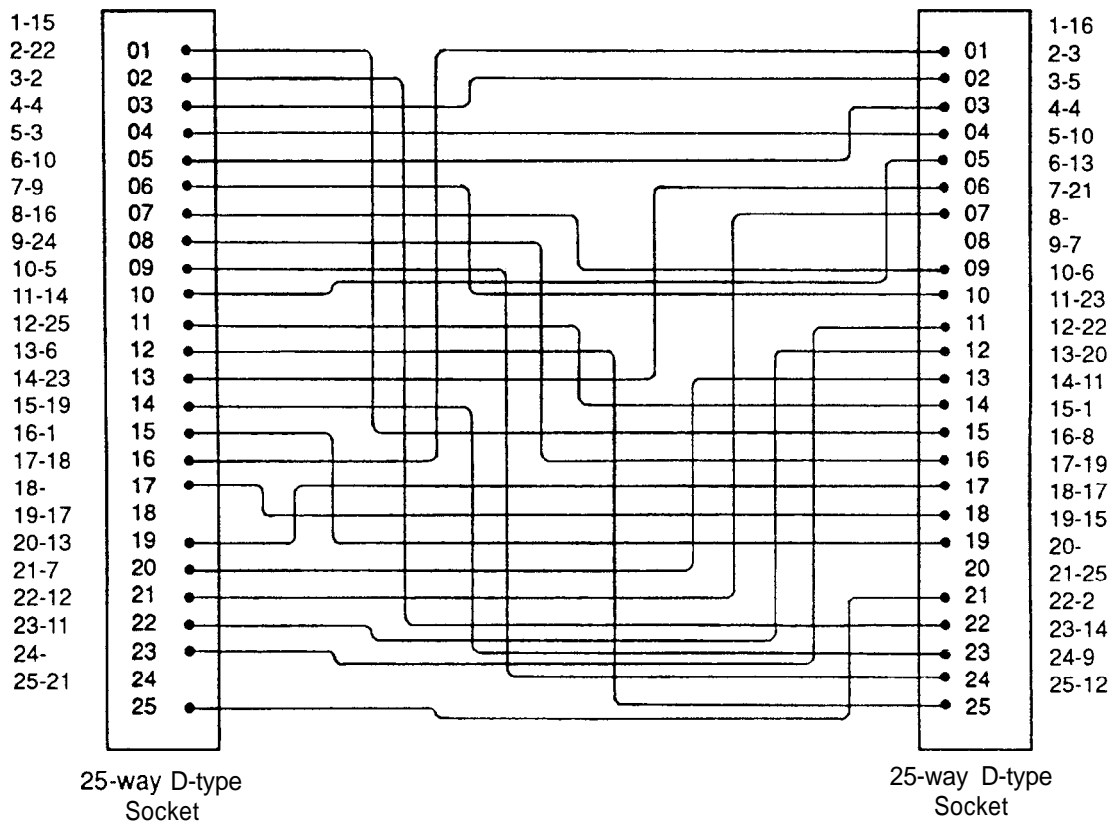
Socket on PCB 108A  
(Photocell Board)



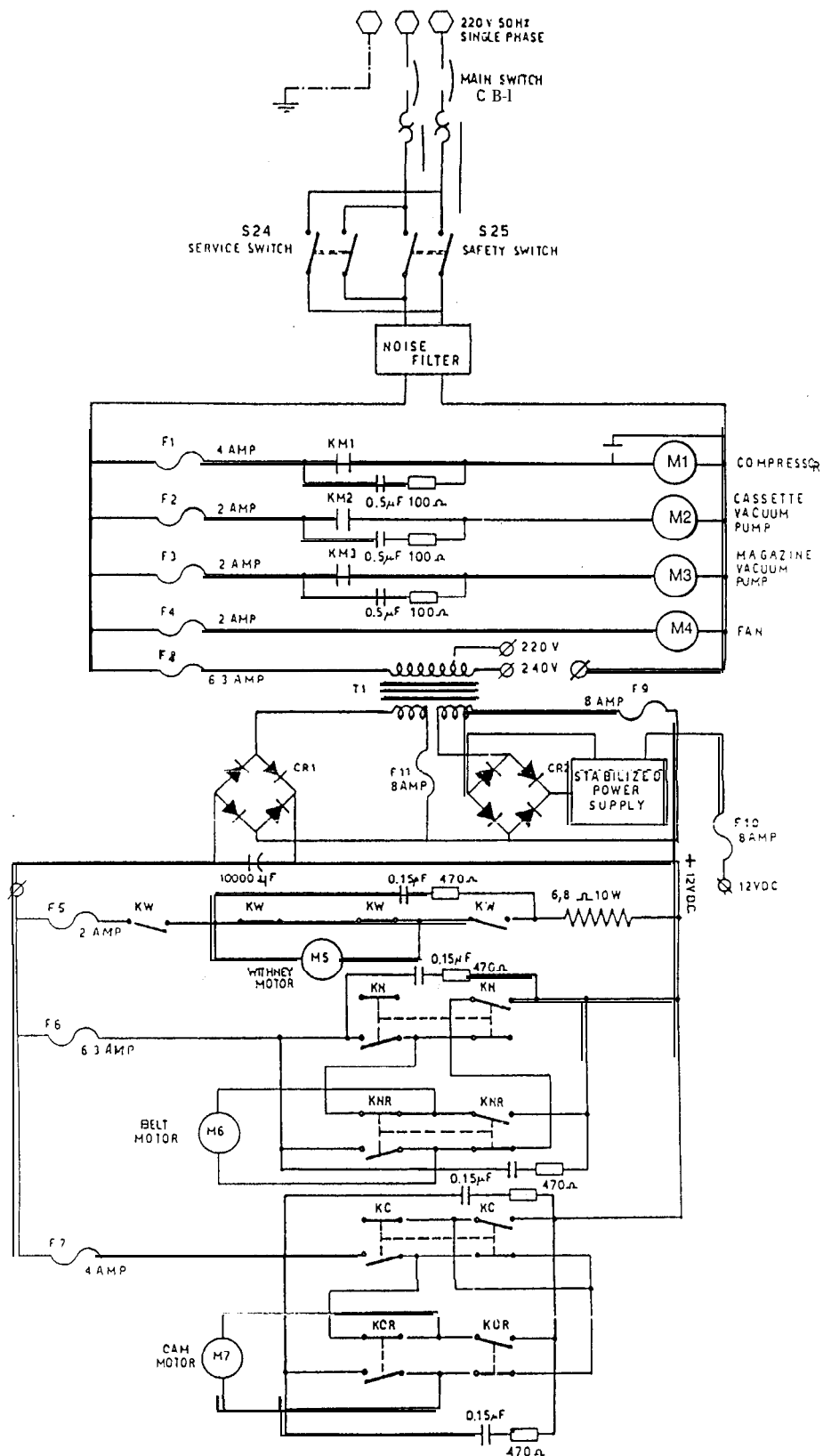
Cable from PCB 108 to  
Mother Board Photocell Board

Socket at  
Display Panel End

Plug at  
Mother Board End



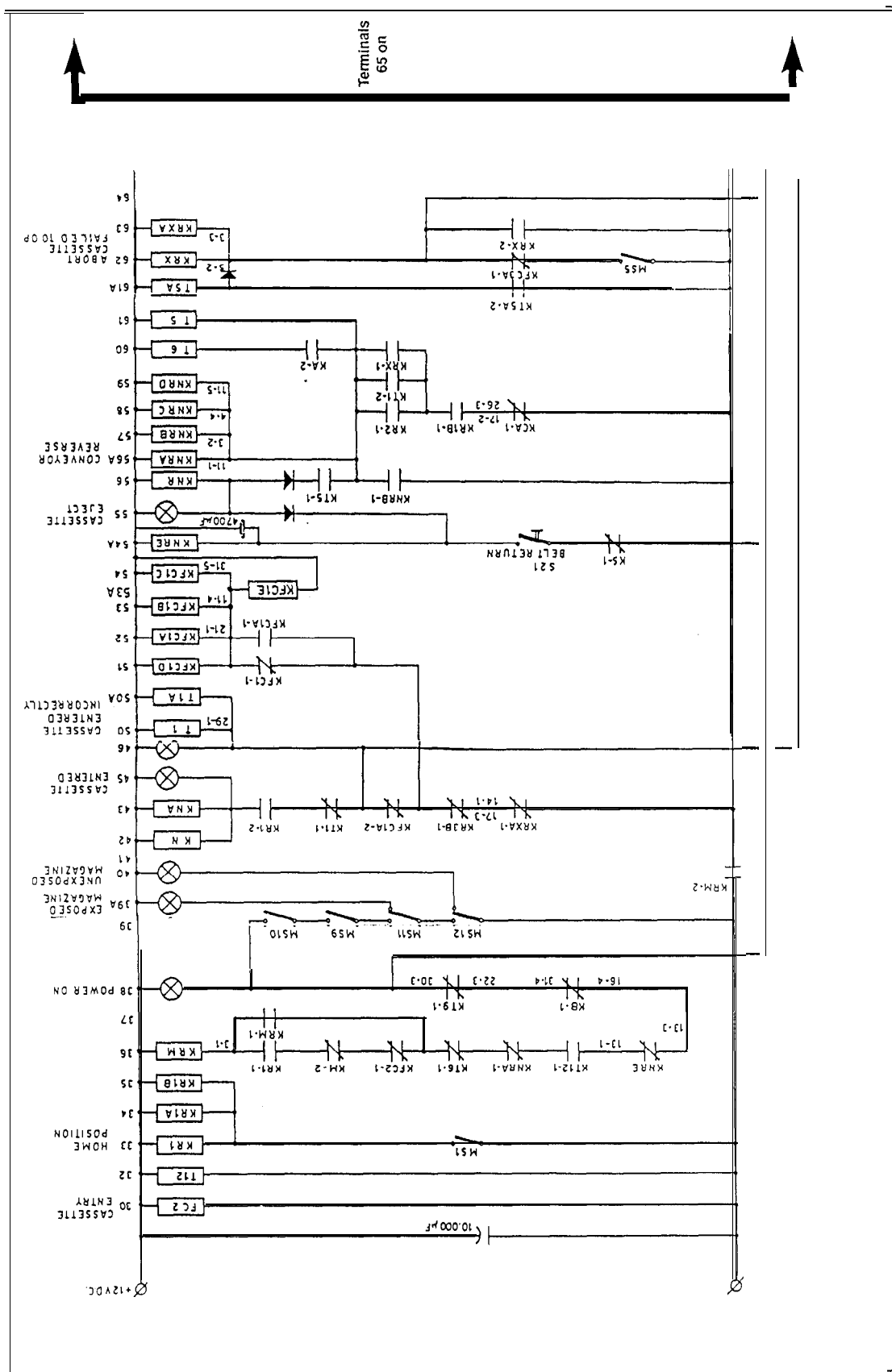
Cable from Display Panel to  
Mother Board

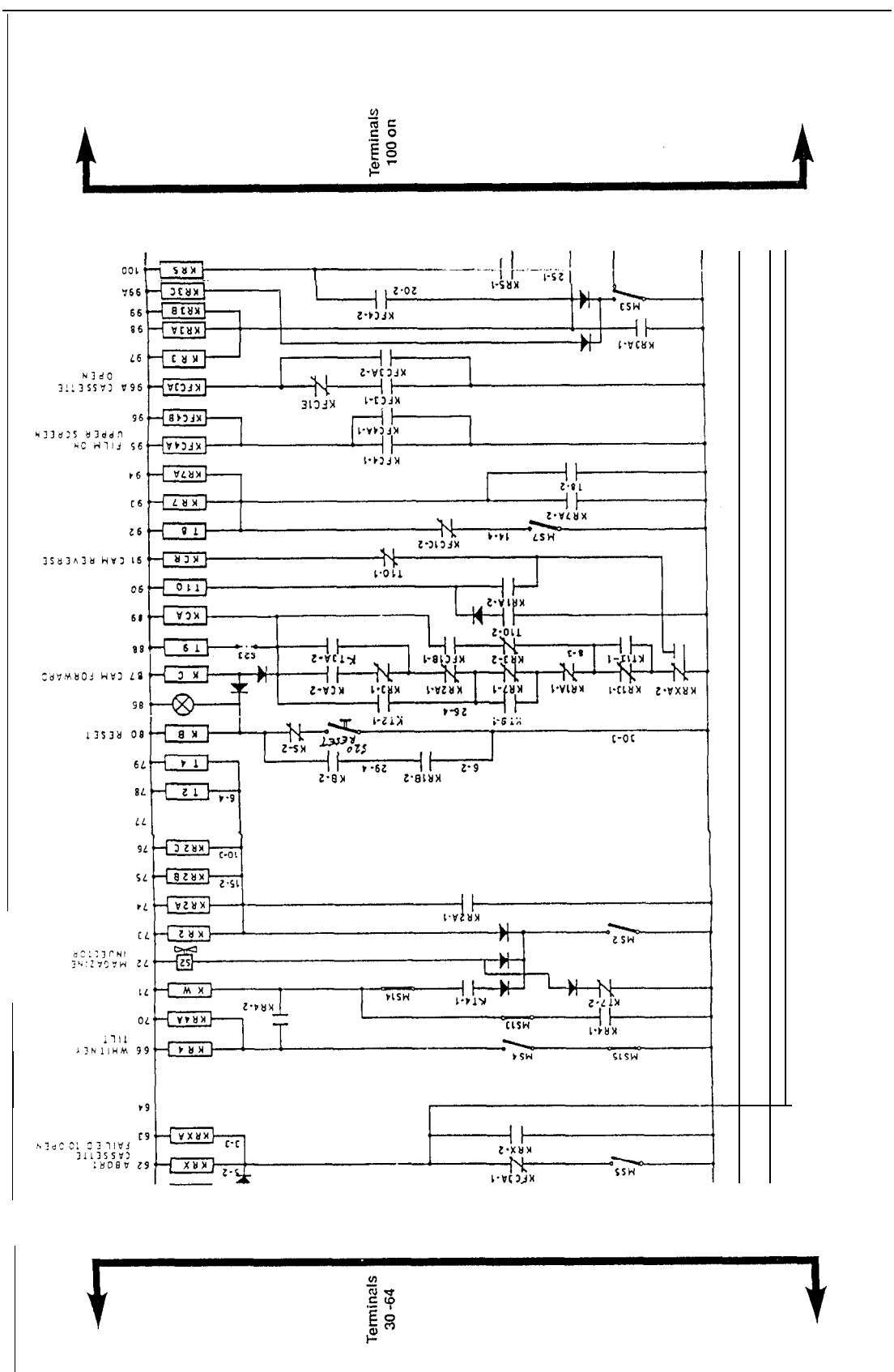


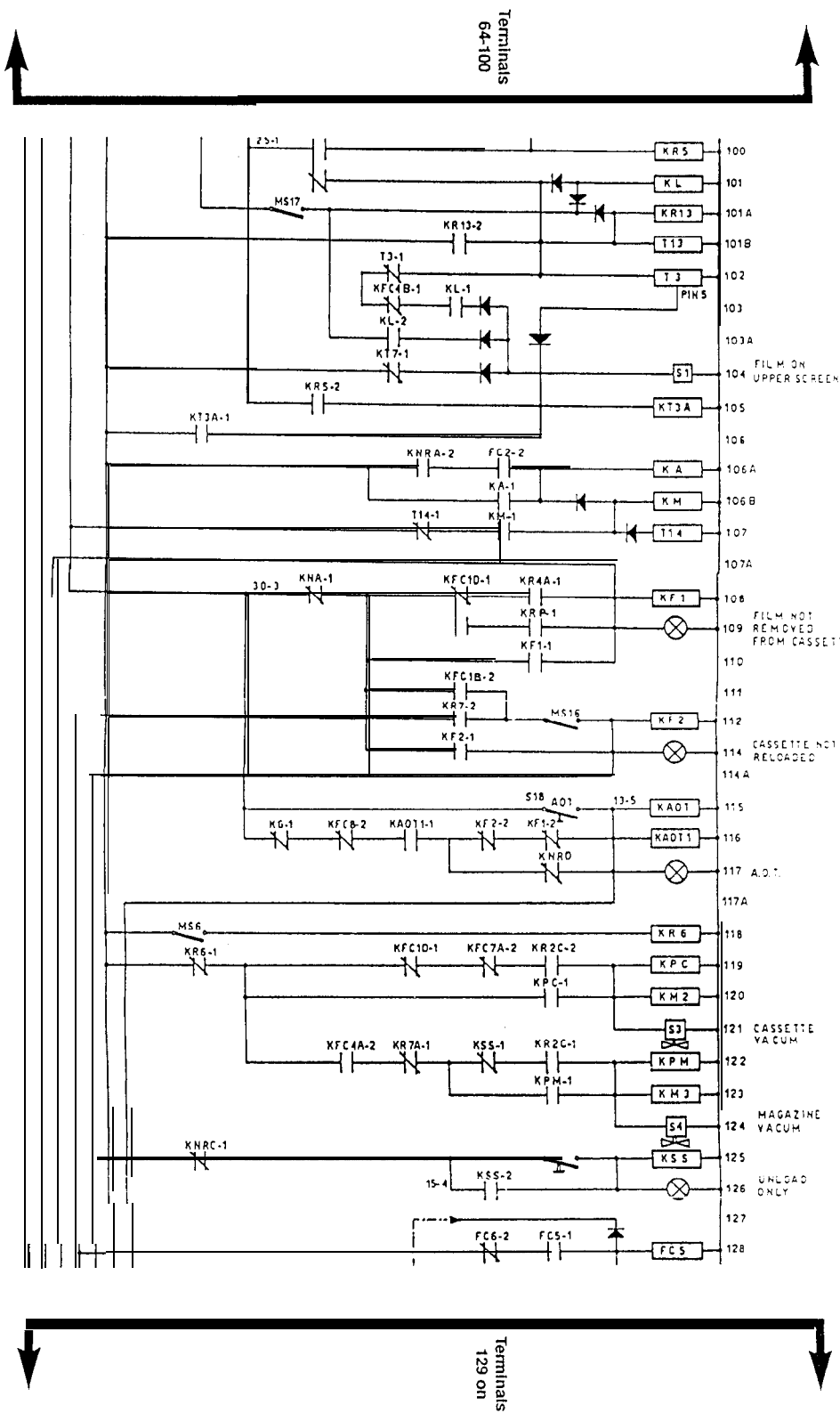
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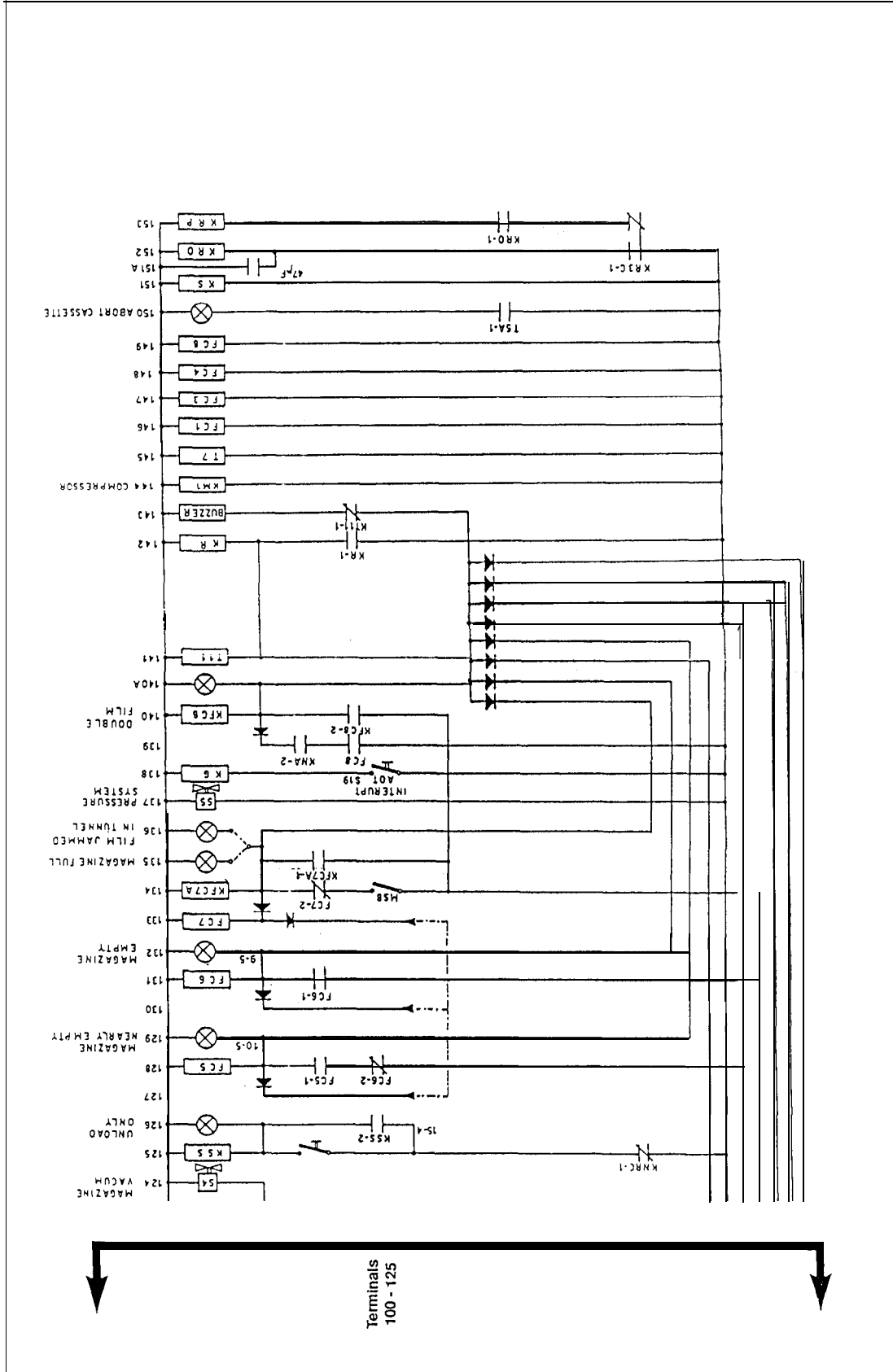
Circuit Diagram 1  
Serial No. 1162 To 1216











Circuit Diagram 2.4  
Serial No. 1162

