

JMG

BRITISH RAILWAYS ~ SOUTHERN REGION

TYPICAL INTERLOCKING CIRCUITS

FOR INTERLOCKINGS COMPLYING WITH B.R. SPEC. 850.

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		SELECTIVE OVERRIDE LINK			

DRAWN BY CHECKED BY APPROVED BY	ISSUE 2 SHEET 16 WAS 10, 17 WAS 48 APPENDICES ADDED. SHEET 28 WAS TWO TO FOUR ASPECT TRANSITION (LAMP OR CONTROLS CIRCUIT)		Southern Region Chief Signal and Telecommunications Engineer	 British Rail
	ISSUE 3 ALL DRAWINGS NUMBERED.		Typical Interlocking Circuits Index	Chief Signal and Telecommunications Engineer
				No. EI-28-1

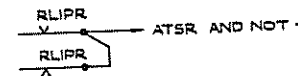
STANDARD CONTACTS. WHERE CONTACTS HAVE BEEN STIPULATED ON THESE SHEETS SUCH CONTACTS SHOULD BE EMPLOYED.
REPEAT RELAYS. FOR CONVENIENCE THESE CIRCUITS HAVE IGNORED IN GENERAL REPEAT RELAYS. REPEAT RELAYS NEED NOT BE DOWN-PROVED EXCEPT WHERE SPECIFIC REFERENCE IS MADE.
 FOR EXAMPLE IN POINT LOCK CIRCUITS SHEET 13 REPEAT RELAYS CAN BE USED IN LIEU OF THE PRIMARY RELAY.

EXCEPT (i) TRACK TIMERS MUST BE CONTROLLED BY THE FIRST TPR IN THE RELAY ROOM.

(ii) THE SIGNALMAN'S INDICATION AND THE TECHNICIAN'S PANEL INDICATION SHOULD BOTH BE CONTROLLED BY THE LAST REPEAT RELAY.

(iii) WHEN A USIPR IS GENERATED THE CASCADE IS CONTROLLED BY THE USIPR AND NOT THE USR.

(iv) FRONT-TO-BACK, AND VICE-VERSA, CHANGE-OVERS SHOULD BE OVER THE SAME RELAY e.g.

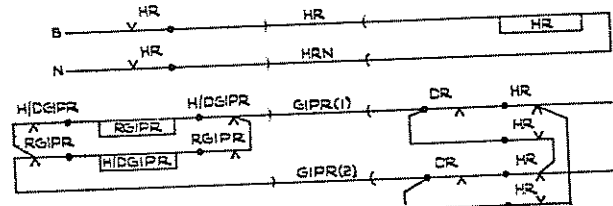
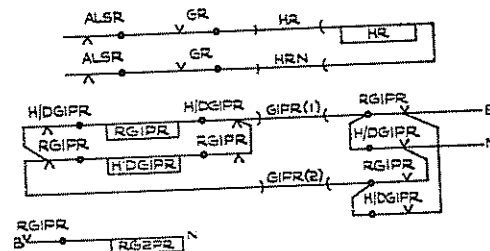


REPEAT RELAY TITLES FRONT REPEATERS TO BE KNOWN AS --IPR, --2PR etc. BACK REPEATER AS --ICR, --2CR etc.
TRACK TIMERS TITLES TRACK TIMERS TO CALLED TIR(15) WHEN TRACK DOWN FOR 15 SECONDS, TZUR(15) WHEN TRACK CLEAR FOR 15 SECONDS.

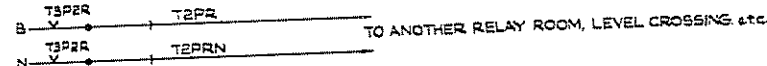
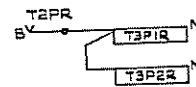
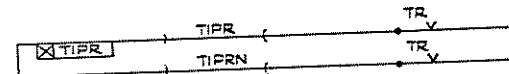
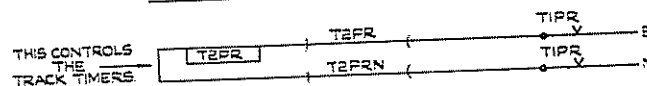
OUTGOING LINE CIRCUITS MUST BE DOUBLE-CUT BY CONTACTS OF THE SAME RELAY IN EACH LEG.

LOCAL & EXTERNAL POWER SUPPLIES LOCAL (i.e. WITHIN RELAY ROOM OR LOCATION) POWER SUPPLIES TO BE SUFFIXED WITH A '1' e.g. B¹SO.
 AND EXTERNAL WITH A '2' e.g. B²SO. WHERE SEPARATE SUPPLIES ARE NOT PROVIDED THE SUFFIX CAN BE OMITTED. e.g. BX10.

FUNCTION NAMES IN MULTICORE. WHEN A FUNCTION, e.g. AN HR, IS REPEATED IN AN INTERMEDIATE LOCATION THE FUNCTION NAME REMAINS UNCHANGED.



EXCEPT FOR TRACK REPEATERS. THE TERM TPR IS RESERVED FOR THE FIRST (SLOW-TO-PICK) REPEATER.

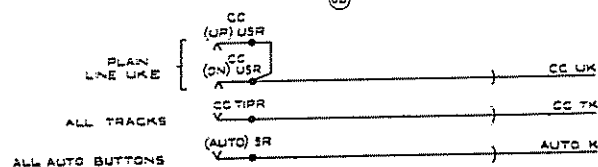
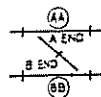
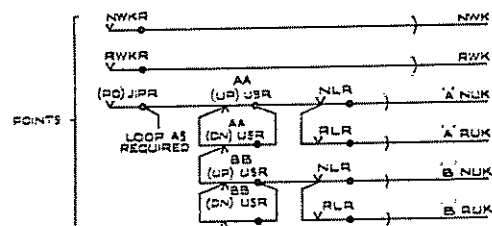
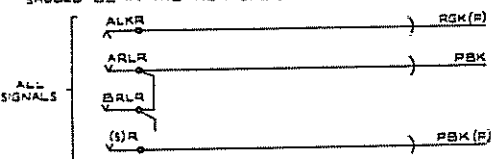
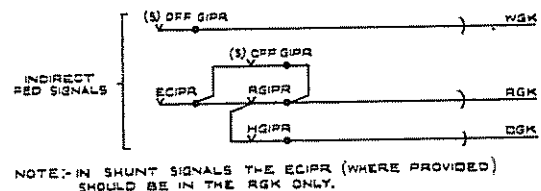
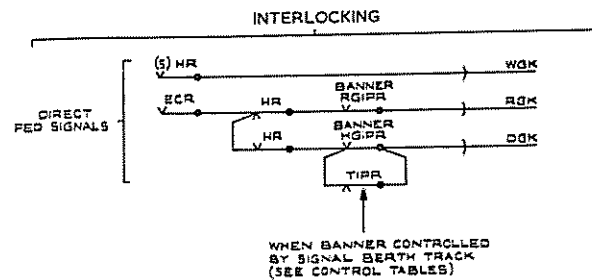


DIAGRAMS & LOCKING EXTRACTS SHOWN IN THIS BOOK HAVE BEEN CONTRIVED FOR DEMONSTRATING CIRCUIT PRINCIPLES. THE LOCKING IS NOT NECESSARILY TYPICAL.

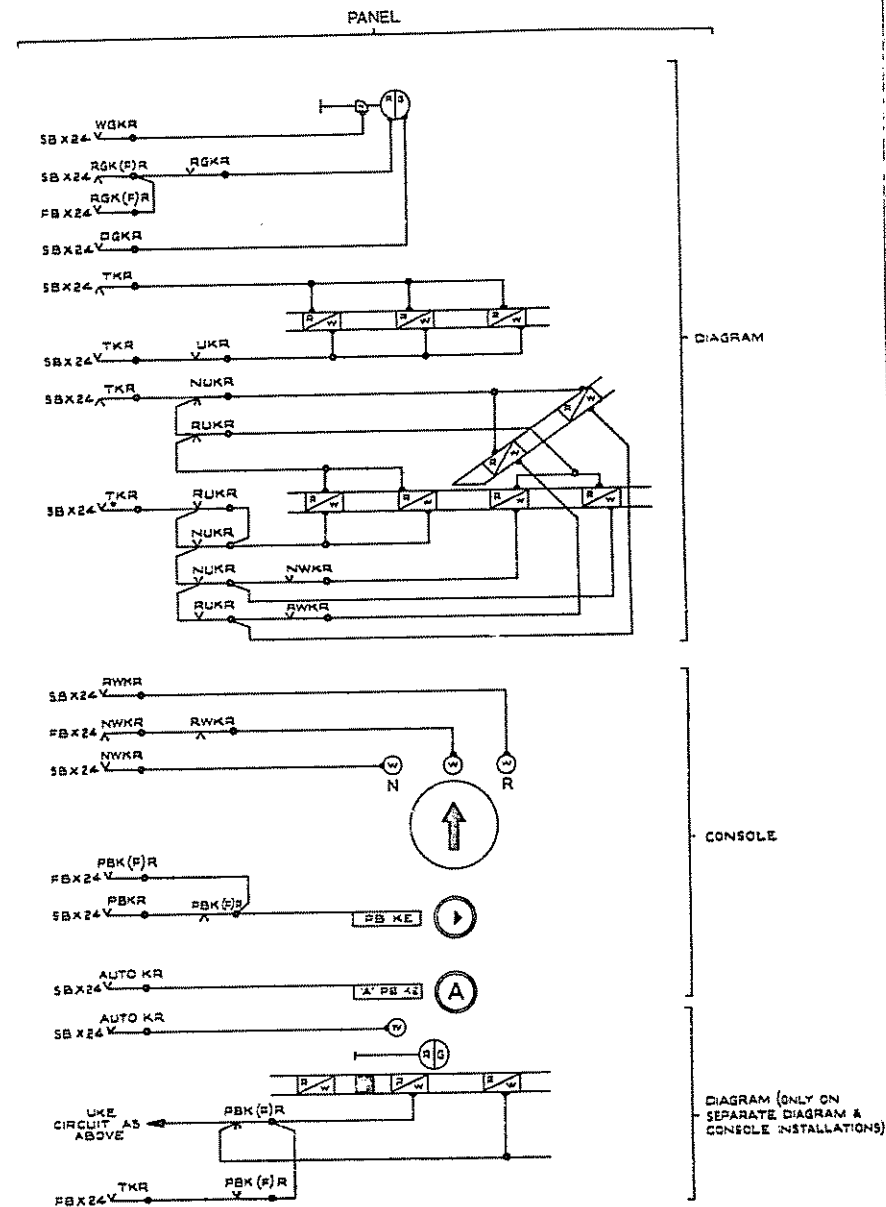
ISSUE 2	REPEATER TITLES NOW T2PR ETC.
ISSUE 3	REPEATER C.C.T.'S MADE 2 WIRE POLAR.
ISSUE 4	SHEET NUMBER CHANGED

Southern Region
 Typical Interlocking Circuits
 General Notes

British Rail
 EI-28-2



FOR SPECIAL REQUIREMENTS FOR OVERLAP ROUTE TRACK LIGHTS SEE SHEET 4B.



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TRACED BY
CHECKED BY

ISSUE 2
SPECIAL REQUIREMENTS FOR
LONDON BRIDGE STYLE PANEL
BETTER EMPHASISED.

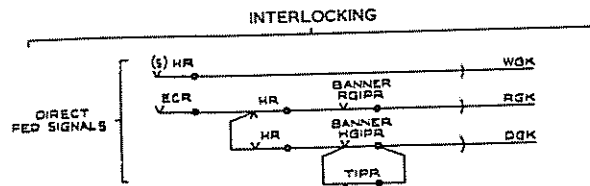
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British Rail

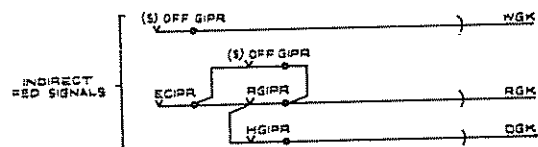
Typical Interlocking Circuits
Panel Indications
Associated Wiring

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Telecommunications Engineer

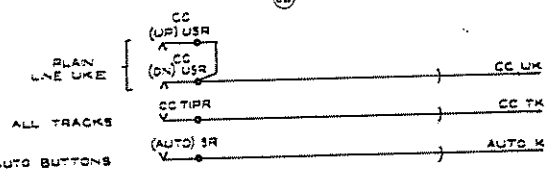
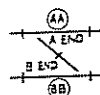
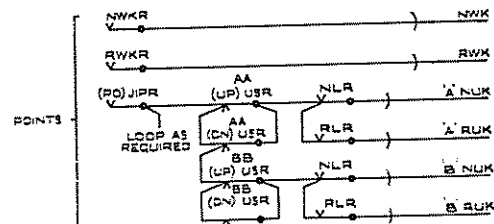
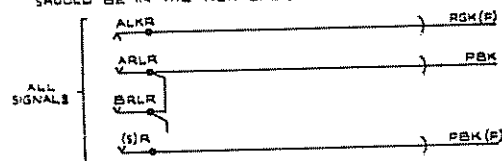
No
E1-28-3



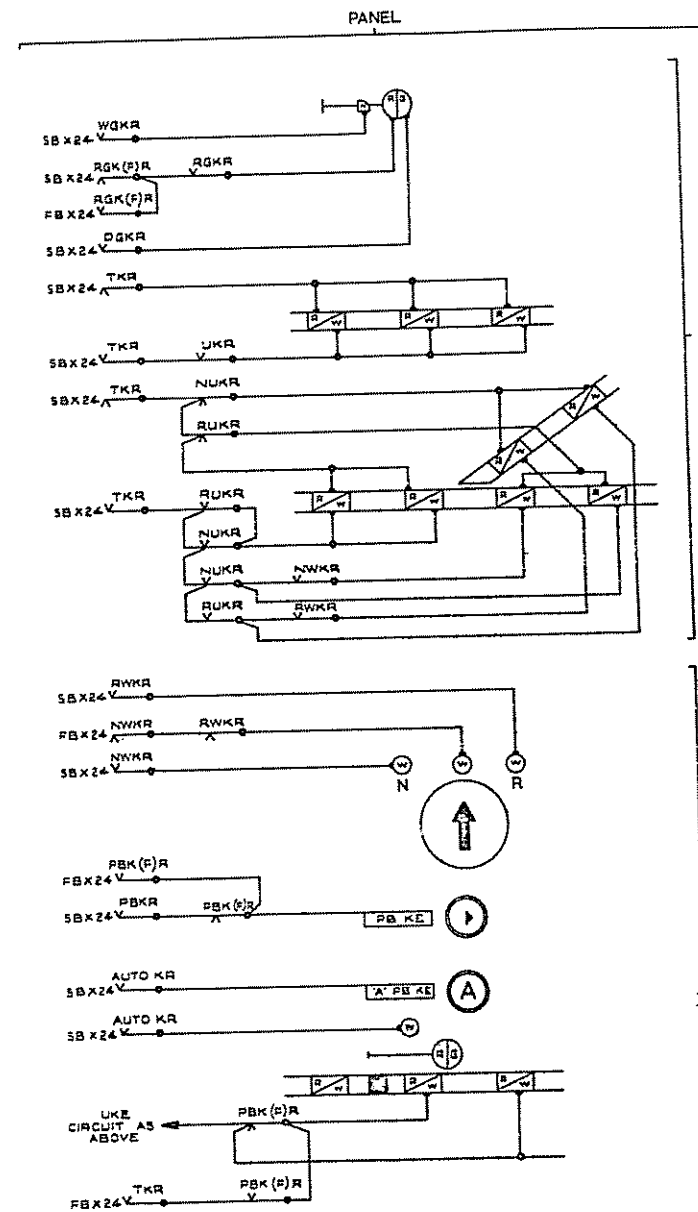
WHEN BANNER CONTROLLED
BY SIGNAL BERTH TRACK
(SEE CONTROL TABLES)



NOTE: IN SHUNT SIGNALS THE ECIPR (WHERE PROVIDED)
SHOULD BE IN THE RGK ONLY.



FOR SPECIAL REQUIREMENTS
FOR OVERLAP ROUTE TRACK
LIGHTS SEE SHEET 45.



DIAGRAM

CONSOLE

DIAGRAM (ONLY ON
SEPARATE DIAGRAM &
CONSOLE INSTALLATIONS)

DESIGNED BY
 FACED BY
 CHECKED BY

ISSUE 2
SPECIAL REQUIREMENTS FOR
LONDON BRIDGE STYLE PANEL
BETTER EMPHASISED.

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Chief Signal and Telecommunications Engineer

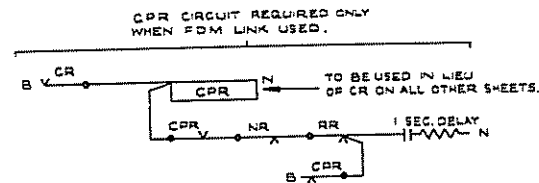
British Rail

Typical Interlocking Circuits
 Panel Indications
 Associated Wiring

Chief Signal and
Telecommunications Engineer

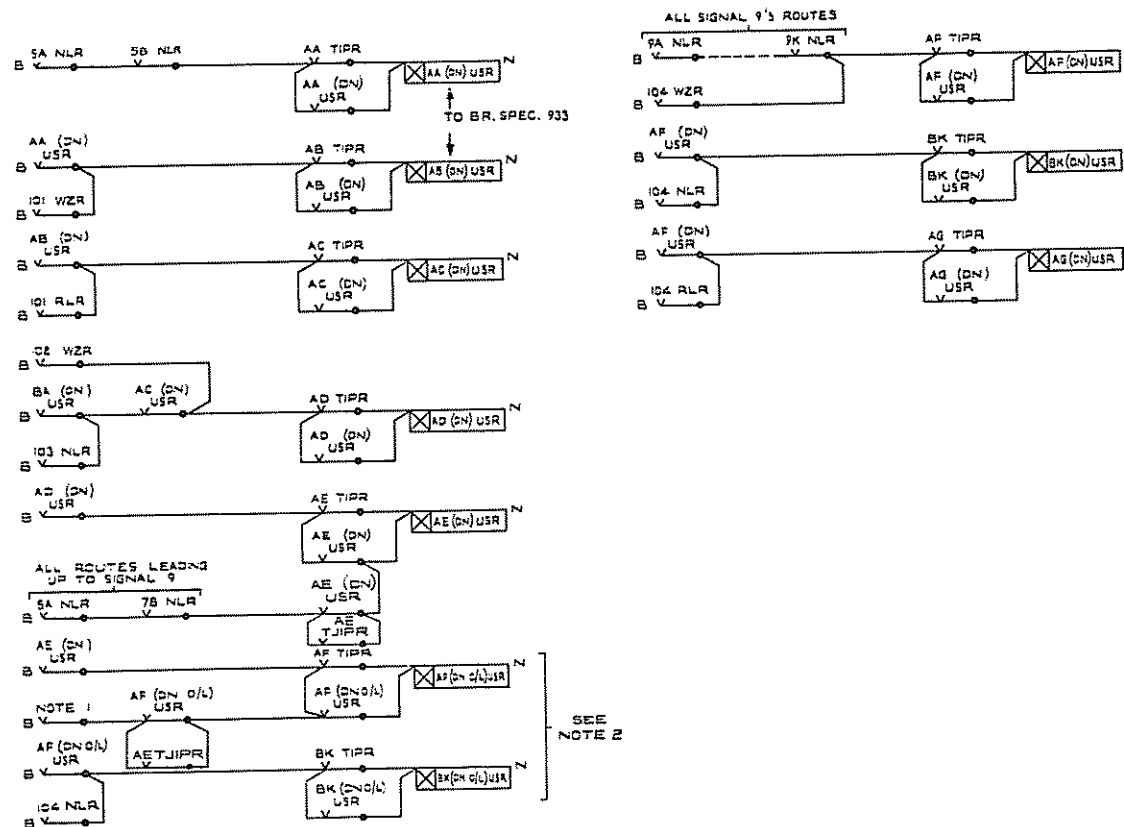
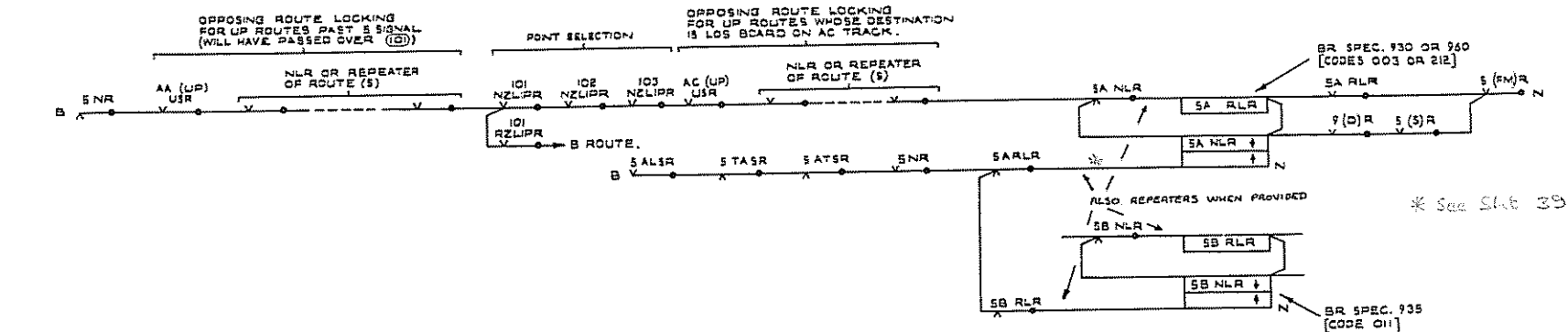
No
EI-28-3

A2



-

Figure 1 is a timing diagram for the PBI Ring. It consists of two main horizontal signal lines, labeled B and B-bar, with various logic components and timing markers. The top path (B) includes components like (ENT) R, (D) RR, and (D) R. The bottom path (B-bar) includes components like (F) R, (F) R, and (F) R. A central text block states: "ALL (F) RS RELEVANT TO ONE PBI RING." The diagram is divided into two main sections by a dashed line. The top section shows the initial setup, and the bottom section shows the subsequent operations.



NOTES

- WHERE (W) ROUTES, OR (C) ROUTES STEPPED UP TO (W) CLASS, DO NOT LOCK BEYOND A TRACK (M) ROUTES NLR CONTACTS IN SERIES REQUIRED HERE.
- PROVIDED ONLY IF LOCKED POINTS IN OVERLAP. SEE ALSO SHEET 20.
- WHERE AN USR IS NOT USED IN EITHER A SIGNAL RLR OR POINT N/RLR CIRCUIT, IN PLACE OF A BR SPEC. 933 RELAY, A BR SPEC. 930 RELAY MAY BE SUBSTITUTED AND CALLED UKR.
- ANY REPEAT USR TO BE USED TO DRIVE NEXT IN CHAIN.

FOR DIAGRAM SEE SHEET 4.

ISSUE 2
RLR WAS SPECIFIED AS 930 RELAY ONLY
104 WZR CONTACT IN BK (DN O/L) USR
WAS SHOWN AS 104 NLR.

ISSUE 3
VR (P) REPLACED BY NR.
AF & BK (DN O/L) USRS & NOTES
AMENDED.

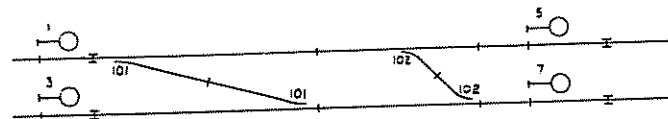
Southern Region
Chief Signalling and Telecommunications Engineer

British Rail

Typical Interlocking Circuits
Route Relays and
Route Sticks

Chief Signalling
Telecommunications Engineer

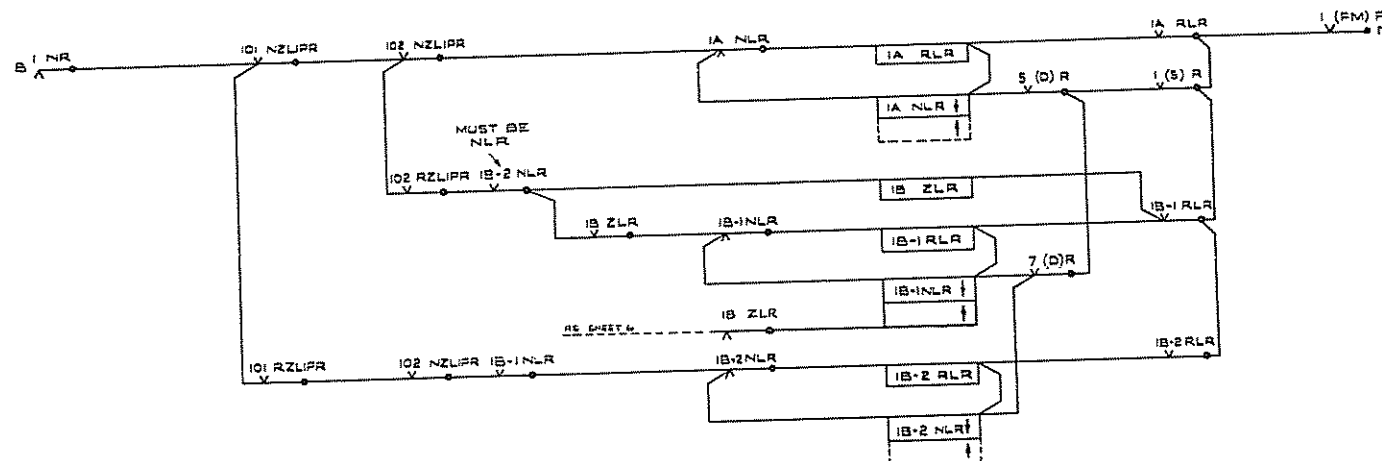
E1-28-6



EXTRACT FROM SIGNAL CONTROLS.

ROUTE	EXIT	REMARKS
1A	5	
1B-1	7	
1B-2	7	# 17

#17 PREFERRED ROUTE



ALL OTHER CONTROLS, SELECTION, ETC. UNAFFECTED

ZLR TO BE ONE HALF OR A BR. SPEC. 960 RELAY
(CODE: EITHER 211 OR 212 AS REQUIRED)

ISSUED BY	ISSUE 2
ISSUED BY	1B AND 1C WERE NOT CROSS-LOCKED
CHECKED BY	1B ZLR BACK WAS IN 1C NLR +
	1C NLR FRONT WAS IN ZLR ONLY.
	ISSUE 3
	ROUTES RENAMED
	YR (P) ELIMINATED.

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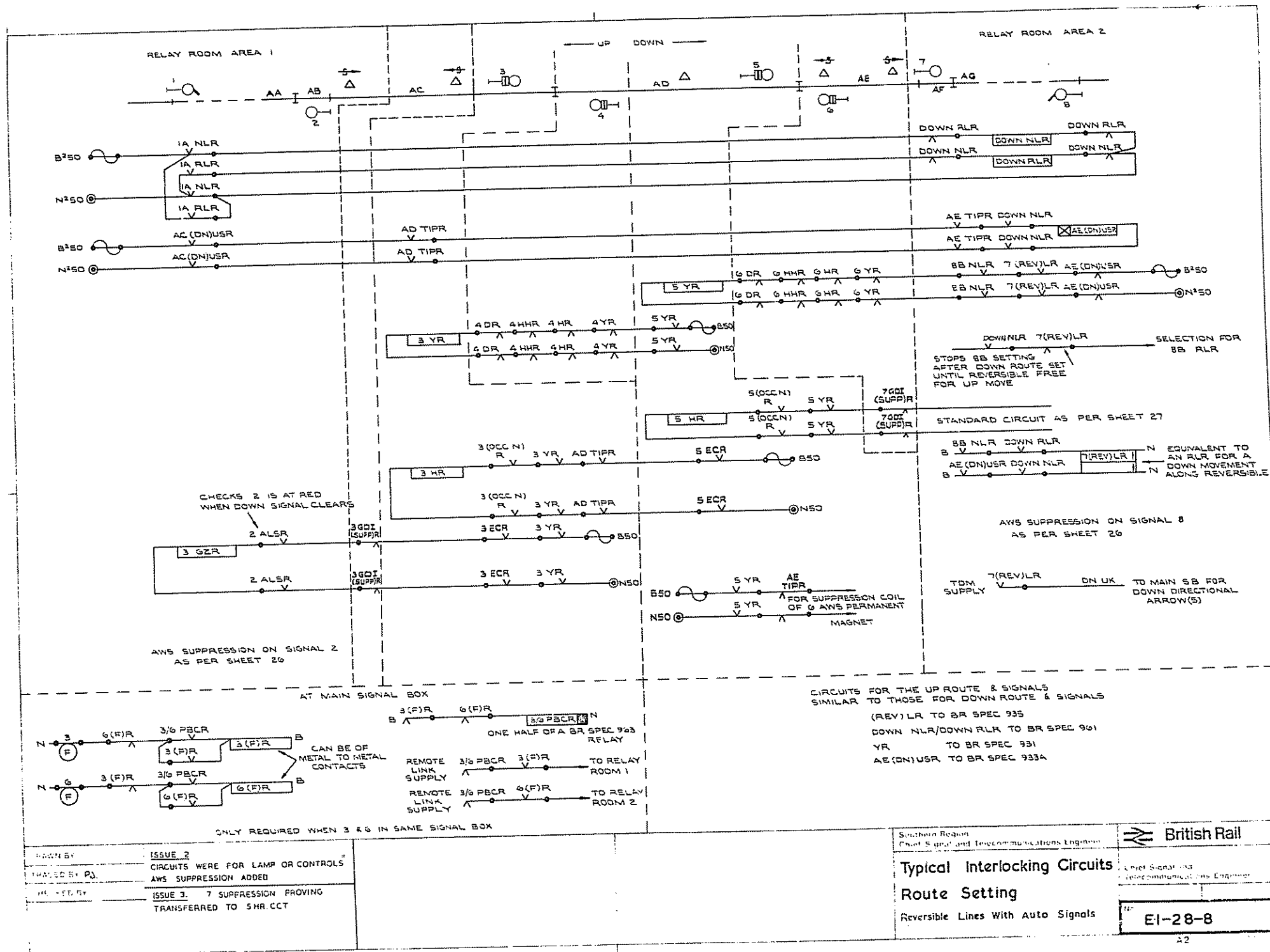
British Rail

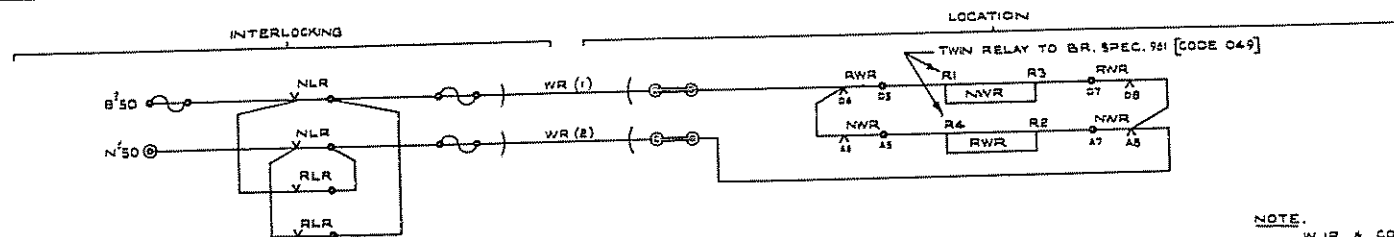
Typical Interlocking Circuits

Chief Signal and Telecommunications Engineer

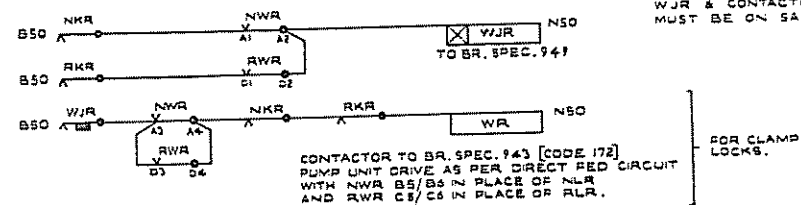
Preferred Routes

for EI-28-7

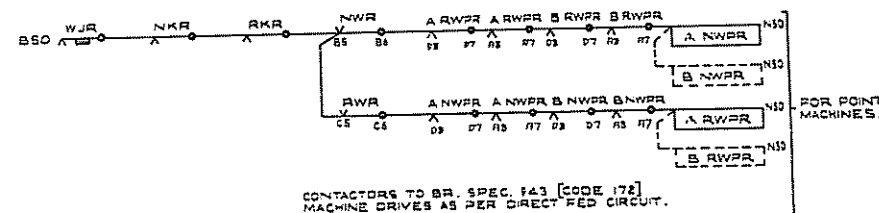
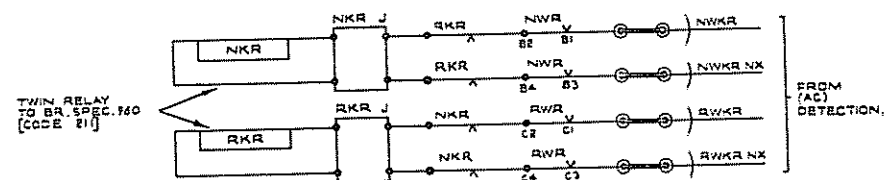




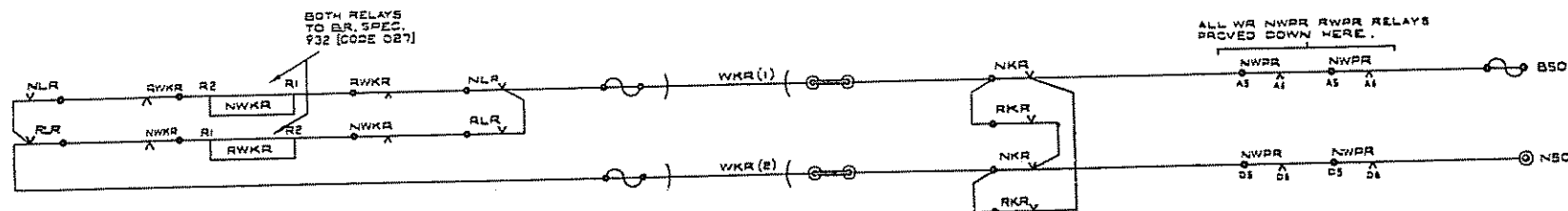
NOTE.
WJR & CONTACTORS
MUST BE ON SAME FUSE.



FOR CLAMP
LOCKS.



FOR POINT
MACHINES.



DRAWN BY
TRACED BY
CHECKED BY

ISSUE 2. NO ALTERATION.
ISSUE 3. WKR CCT. MADE
2 WIRE POLAR.

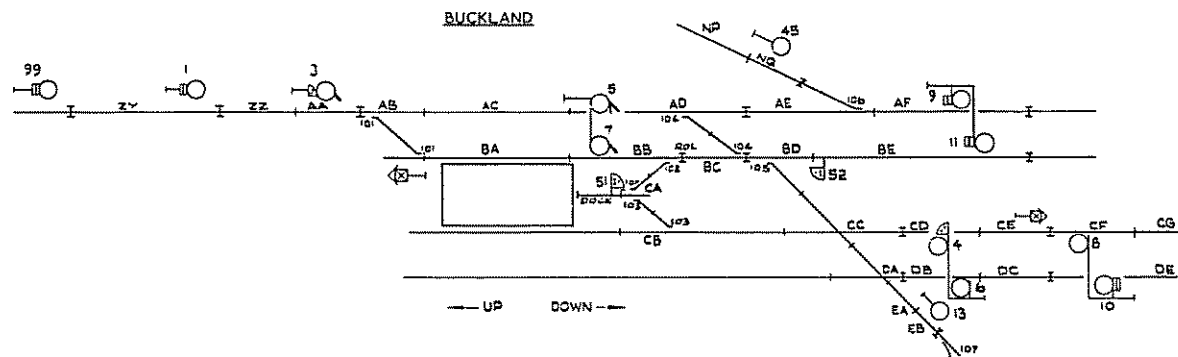
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Typical Interlocking Circuits
Indirect Fed Points

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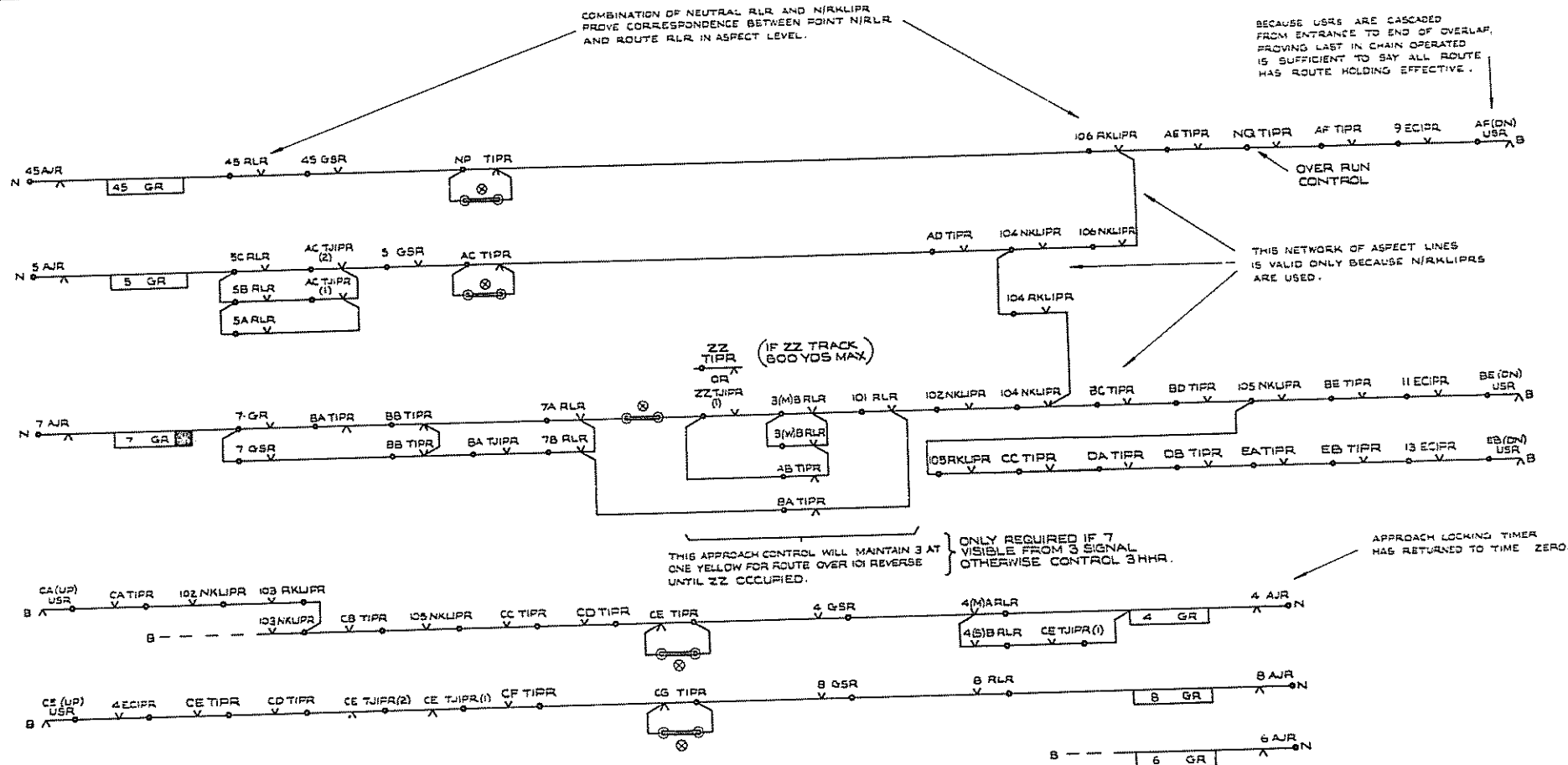
FI-28-14



NOTES:-

- 1) 101 IS A HIGH-SPEED TURNOUT WITH BRAKING DISTANCES SUCH THAT 3(M)B CAN CLEAR TO Y & I SIGNAL TO YY (SEE CO. INS. B3).
- 2) SIGNAL 7 IS NOT FIRST WHEEL REPLACED BY BB.
- 3) SIGNAL 3 (B ROUTE) HAS STEP-UP FACILITY ON ASPECTS.
- 4) CC TRACK FLANK CONTROL IS SHOWN ONLY IN S2 ASPECT.

DRAWN BY	ISSUE 2 NOTE RE CD TJIPR REMOVED NOTE RE CC AS FLANK ADDED		Southern Region Chief Signal and Telecommunications Engineer	British Rail
TRACED BY <i>P</i>				Chief Signal and Telecommunications Engineer
CHECKED BY	ISSUE 3 SEPARATE O/L TRACKS ADDED.		Typical Interlocking Circuits Aspect Controls	
			Diagram For Sheets 19 to 21 25, 27	Ref: E1-28-18



NOTE.
 TRACK TIMERS ARE NAMED BY THE TIME IN SECONDS.
 EG EJ TJIPR (40) IS EJ OCC FOR 40 SECS.
 EJ TJIPR (5) IS EJ CLEAR FOR 5 SECS.
 (CE TJIPR (1) AND CE TJIPR (2) ARE THUS NAMED TO DISTINGUISH EACH RELAY FOR THESE EXAMPLE GR CIRCUITS ONLY.)
 ALL TJIPRS ARE DOWN PROVED IN THE ASPECTS ON SIGNALS READING OVER THAT TRACK.
 [ALL TJIPRS IN TABR (WHERE POSSIBLE)]

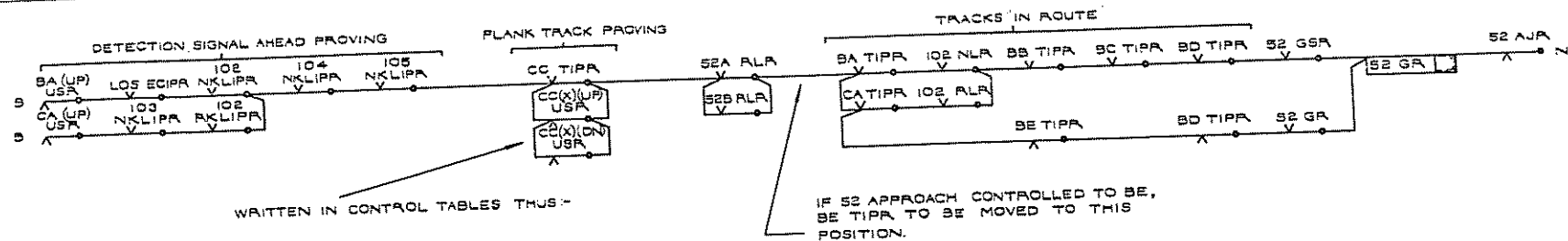
⊗ = TEMPORARY APPROACH CONTROL LINK
 (#3 ON CONTROL TABLES)

FOR DIAGRAM SEE SHEET 18.

DRAWN BY	ISSUE 2
CHECKED BY HR	CIRCUITS WERE "LAMP OR CONTROLS" NOTE RE CD TJIPR REMOVED.
RECEIVED BY	ISSUE 3 SEPARATE C/L TRACKS ADDED.

Typical Interlocking Circuits
 Aspects
 Running Signals GR
 (Non-Stepping Up)

British Rail
Signal and Telecommunication Engineer
Signal and Telecommunication Engineer
EI-28-19



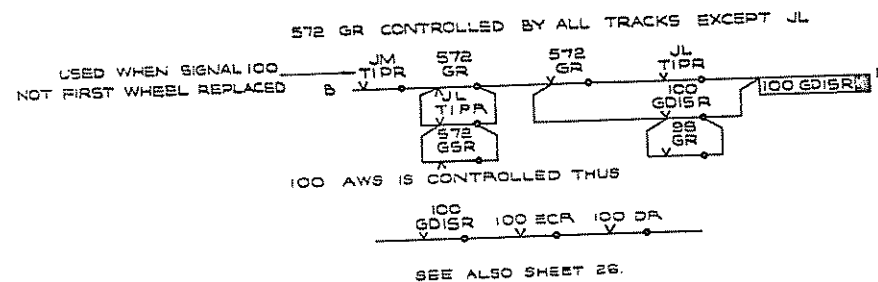
GENERAL NOTE ON CONTROL TABLES STATES

TRACK CIRCUIT CONTROLLED SHUNTS
HELD OFF UNTIL REPLACEMENT CONDITIONS SATISFIED

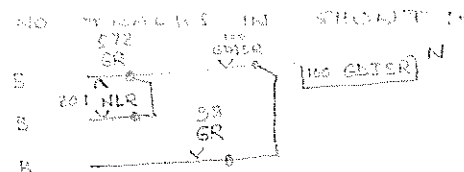
THIS APPLIES TO TRACKS 'IN ROUTE' ONLY.

SHUNT GR S CAN BE NETWORKED AS MAIN SIGNALS GR S
BUT ONLY FOR DETECTION, SIGNAL AHEAD AND USA
PROVING.

PERMISSIVE SHUNT READING INTO PLATFORMS IN SAME DIRECTION AS A RUNNING MOVE.



See D.O.I. 80



For DIAGRAM SEE SHEET 18

DRAWN BY

ISSUE 2.
NO ALTERATION FROM ISSUE 1.

TRACED BY

ISSUE 3.
PERMISSIVE AWS CIRCUIT
AMENDED.

CHECKED BY

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Chief Signal and Telecommunications Engineer

British Rail

Typical Interlocking Circuits

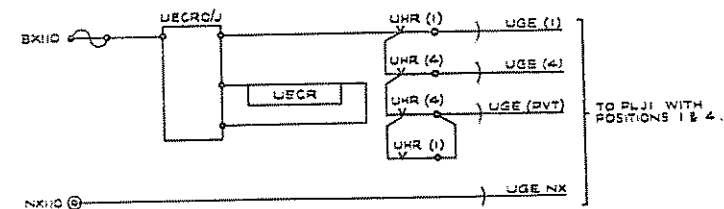
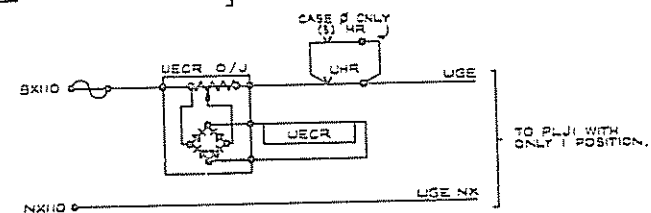
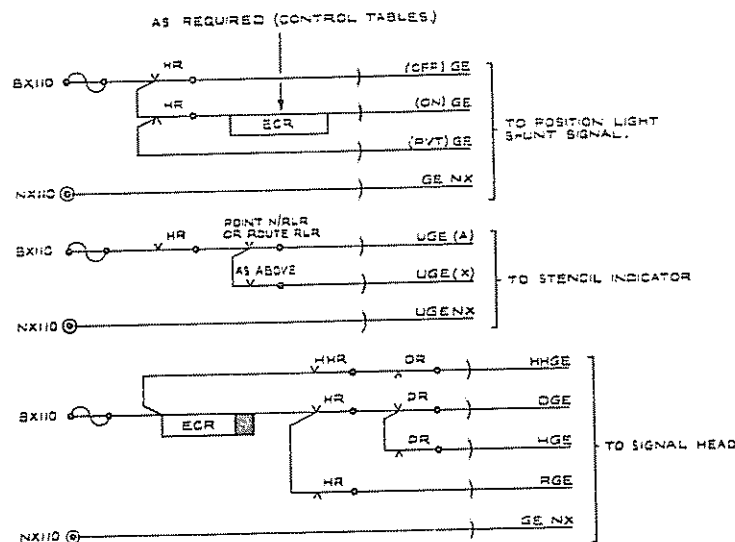
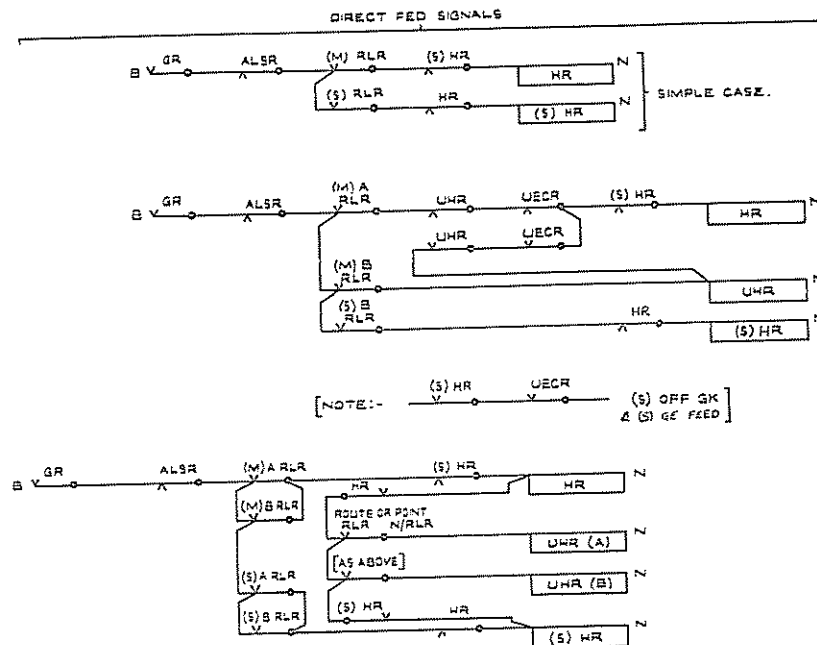
Chief Signal and
Telecommunications Engineer

Aspects

Shunt Signals GR

No
EI-28-21

SEE SHEET 24 FOR
MULTI-LAMP ROUTE
INDICATOR LIGHTING
CIRCUITS.



DRAWN BY
TRACED BY
CHECKED BY

ISSUE 2
NO ALTERATION FROM ISSUE 1.

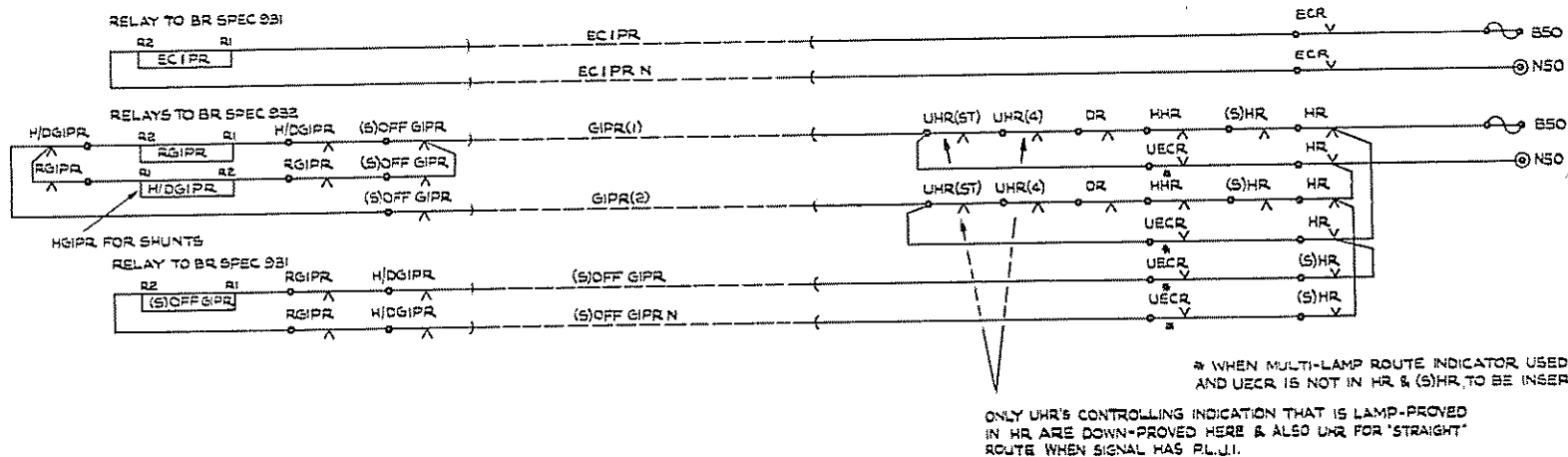
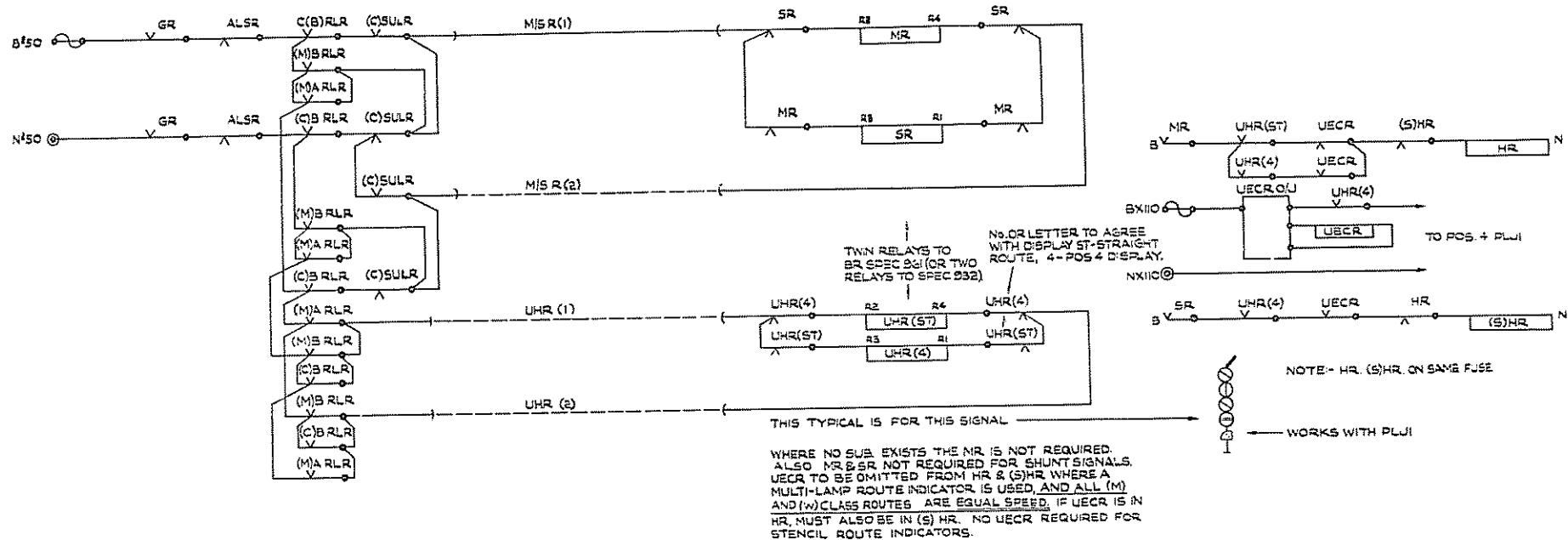
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British Rail

Typical Interlocking Circuits
Signal lighting

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Telecommunications Engineer

EI-28-22



ISSUE 2	ECIPR DELETED - NOT REQUIRED
ISSUE 3	NOTE RE UHR'S ADDED
ISSUE 4	STEPPING UP NOW SHOWN
ISSUE 5	MULTI-LAMP NOTE AMENDED
ISSUE 6	ISSUE 7
ISSUE 8	POLAR COTS MADE
ISSUE 9	2 WIRE

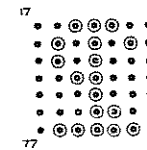
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Typical Interlocking Circuits
Feeds To/From Indirect
Fed Signals

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Telecommunications Engineer

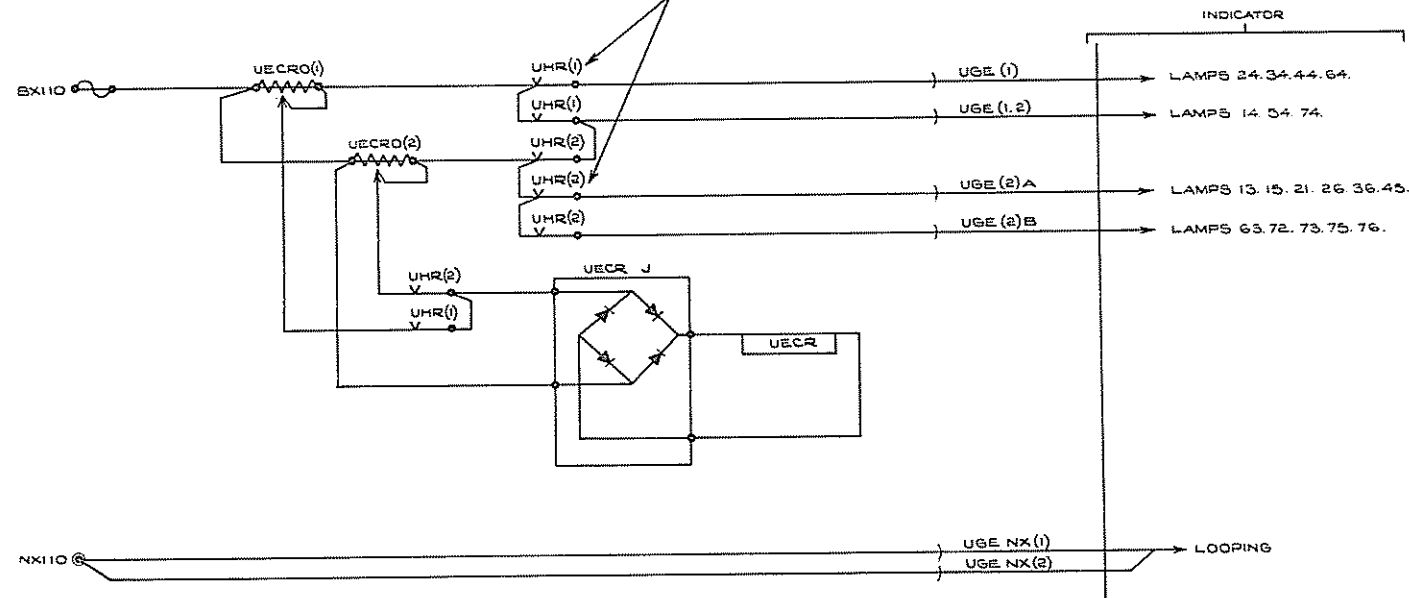
EI-28-23



● POSITION FOR LAMPS
 B LAMPS IN THIS POSITION
 (NOT STANDARD POSITIONS
 - SEE DRAWING E102-43).

UHR NOT DOWN PROVED IN RGPR OR ALSR
 WHEN LAMPS NOT PROVED ALIGHT IN HR.

VIEWED FROM REAR



NOTE:- THE PROVING CIRCUIT MAY REQUIRE ALTERATIONS TO SUIT A PARTICULAR PROVING RELAY

DRAWN BY
 TRACED BY L.D.S.
 CHECKED BY

ISSUE 2.
 PROVING OF UHRS NOTE SIMPLIFIED
 NOTE. RE E102-43 ADDED.

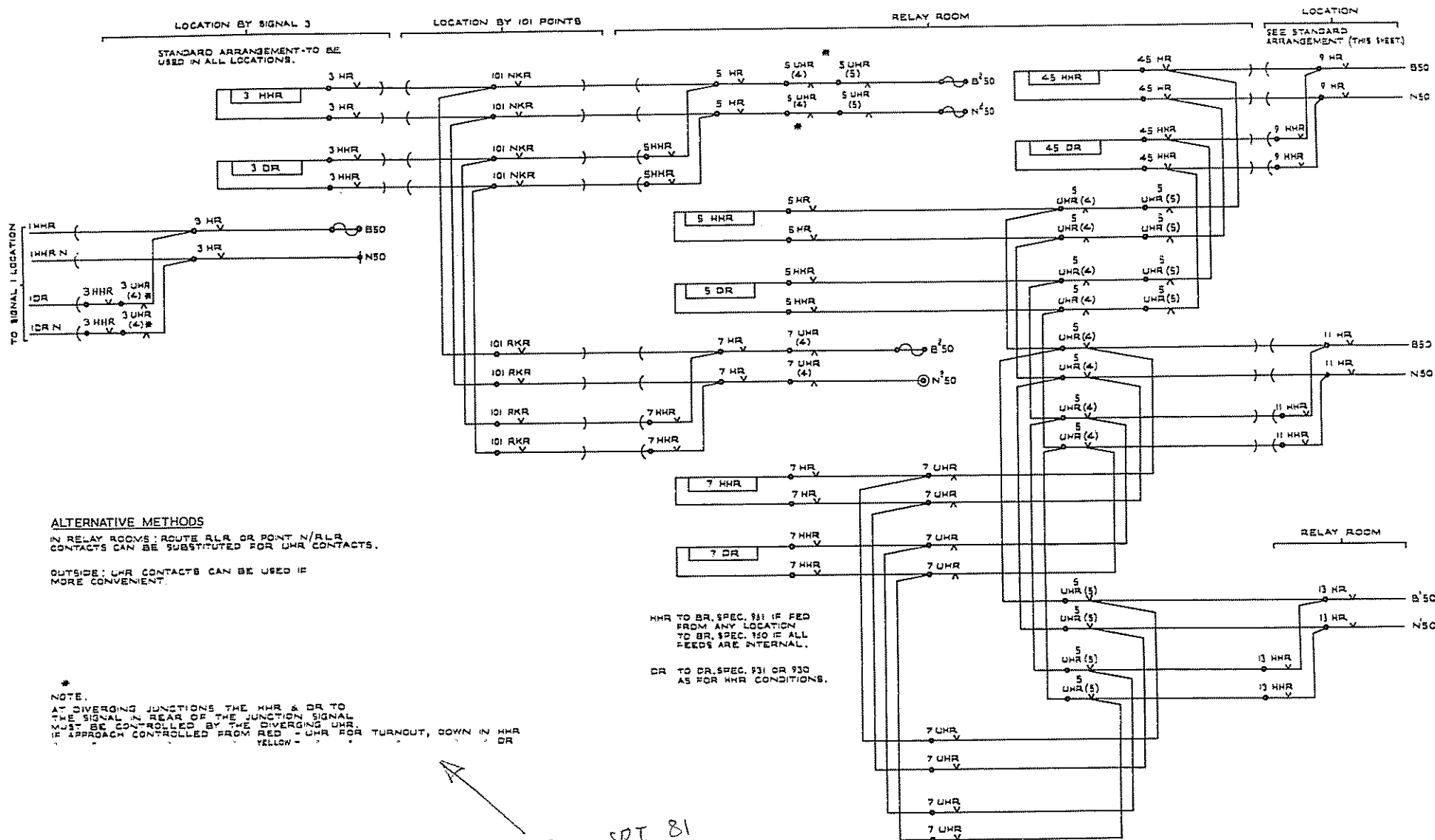
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Typical Interlocking Circuits
 Lighting Of Multilamp Route
 Indicators.

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E1-28-24



ANY PURELY INTERNAL CIRCUIT NEED NOT BE DOUBLE-CUT.
THE AWS CONTROL MUST BE TAKEN FROM THE ECR ITSELF.

FOR DIAGRAM SEE SHEET 18

DRAWN BY
TRACED BY
CHECKED BY

ISSUE 2
CIRCUITS WERE FOR 'LAMP OR CONTROLS'

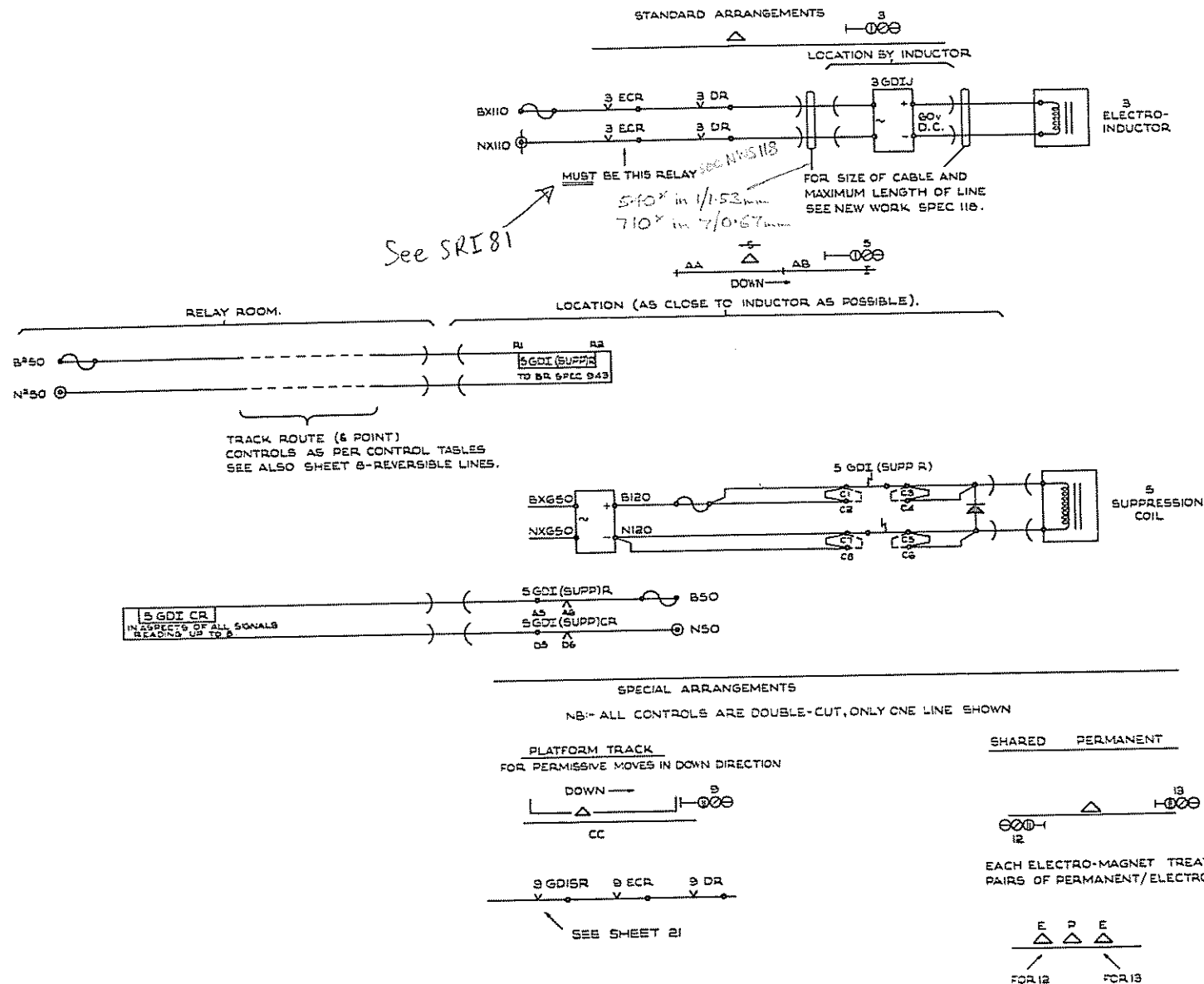
Southern Region
Chief Signal and Telecommunications Engineer

British Rail

Typical Interlocking Circuits
Aspect Sequencing

Chief Signal and
Telecommunications Engineer

E1-28-25



DRAWN BY	ISSUE 2
TRACED BY	DETAILS ON SUPPRESSION UPDATED TO CURRENT STANDARD.
CHECKED BY	ISSUE 3
	PERMISSIVE CIRCUIT AMENDED.

Southern Region
Chief Signal and Telecommunications Engineer

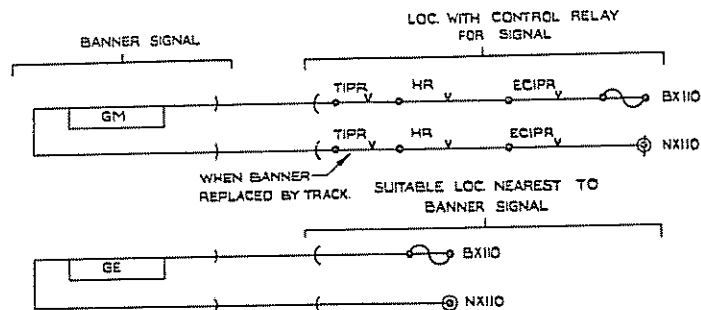
British Rail

Typical Interlocking Circuits

AWS

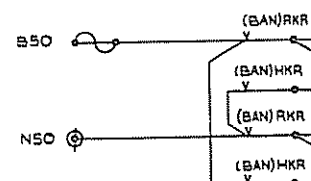
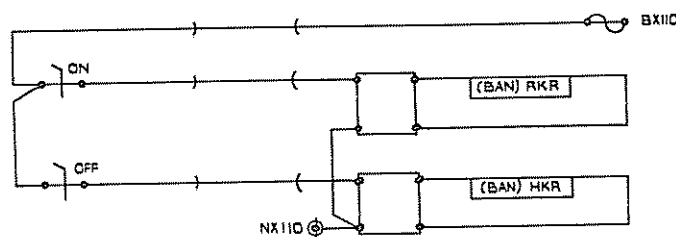
Chief Signal and Telecommunications Engineer

EI-28-26

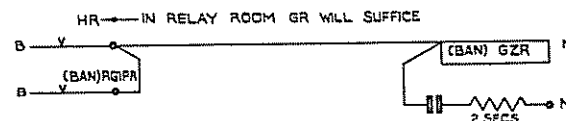
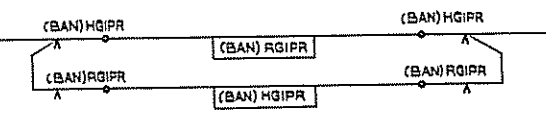


(BAN) HGIPR FED TO RELAY ROOM ONLY WHEN SIGNAL IS DIRECT FED
 — CAN BE ADDED TO SIGNAL H/DGIPR AT OTHER TIMES BUT
 BANNER 'OFF' MUST BE IN ASPECT SEQUENCE AT ALL TIMES

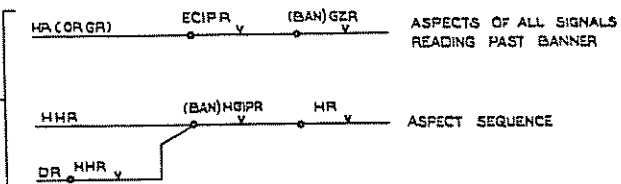
(BAN) RGIPR IS IN ALSR.



IF AUTO SIGNAL — LOCATION WITH CONTROL RELAYS
 IF CONTROLLED SIGNAL — RELAY ROOM



TO
 SIGNAL (S)
 IN REAR



ISSUED BY

ISSUE 3

REPEATER COT MADE

2 WIRE POLAR.

TRAIN BY

DESIGNED BY

Southern Region
 Chief Signal and Telecommunications Engineer

British Rail

Typical Interlocking Circuits
 Banner Signals

Chief Signal and
 Telecommunications Engineer

EI-28-28

ROUTE CONTROLS.

NO ROUTE SETTING LIMITATIONS ARE APPLIED TO ROUTE CONTROLS UNTIL A ROUTE CLASS HAS BEEN ACHIEVED.

WITH ROUTE 53(S)A SET, IO5 SIGNAL CAN ONLY OPERATE AS A SHUNT CLASS ROUTE. THIS CONDITION TO BE MAINTAINED ONCE THE TRAIN HAS PASSED 53 SIGNAL AND 53(S)A

ROUTE NORMALISED.

WITH ROUTES 53(S)B AND 53(M)C SET, SIGNAL IO5 WILL OPERATE IN THE PRE-SET CLASS ONLY. THIS CONDITION IS MAINTAINED UNTIL THE TRAIN HAS PASSED IO5 SIGNAL.

SUMMARY ONCE IO5 ROUTE HAS BEEN SET AS A SHUNT ROUTE I.E. NOT PRE-SET, THE CLASS CANNOT BE CHANGED UNTIL FL TRACK CIRCUIT IS CLEAR AND IO5 ROUTE NORMAL.

ASPECT CONTROLS.

SHUNT SIGNAL IO5. STANDARD ASPECT CONTROLS.

ROUTE 53(S)A. STANDARD ASPECT CONTROLS.

ROUTES 53(M)C AND 53(S)B. NON STANDARD ASPECT CONTROLS PRE-SET CONDITIONS.

PRE-SET CONTROLS ROUTES 53(S)B AND 53(M)C REQUIRE TO PROVE IO5 SIGNAL OFF BEFORE THE ASPECT CAN CLEAR.

SIGNAL IO5 IS USED AS A PRE-SET SIGNAL AND IS REQUIRED TO PROVE THE COMPLETE ROUTE CONDITION I.E. ALL TRACK AND POINTS AS REQUIRED BY THE MAIN ROUTE

BEFORE CLEARING. ONCE PRE-SET AND MAIN SIGNALS HAVE CLEARED, TRACKS BETWEEN THE MAIN SIGNAL AND THE PRE-SETTING SHUNT SIGNAL TO BE SELECTED OUT OF

PRE-SET ASPECT LEVEL TO AVOID PREMATURE REPLACEMENT.

REPLACEMENT CONDITIONS

TRAIN ON THE APPROACH SIDE OF MAIN SIGNAL. PULLING MAIN SIGNAL BUTTON WILL REPLACE BOTH MAIN AND PRE-SET SIGNAL. SIGNALS MAY BE RECLEARED BY RESTROKING

THE COMPLETE ROUTE. WITH THIS REPLACEMENT. ASSUMING SIGNAL APPROACH LOCKED. THE APPROACH LOCK RELEASE TIME WILL OPERATE.

PULLING THE PRE-SET BUTTON WILL REPLACE BOTH MAIN AND PRE-SET SIGNALS. SIGNALS MAY BE RECLEARED BY RESTROKING THE ENTIRE ROUTE. WITH THIS REPLACEMENT

THE APPROACH LOCKING WILL NOT TIME.

TRAIN PASSED MAIN SIGNAL, MAIN SIGNAL REPLACED: PULLING MAIN SIGNAL BUTTON WILL NOT REPLACE PRE-SET. PULLING PRE-SET BUTTON WILL REPLACE PRE-SET SIGNAL.

BUT MAY BE RECLEARED BY PUSHING PRE-SET BUTTON. NO APPROACH LOCK RELEASE TIME SEQUENCE WILL TAKE PLACE.

SUMMARY MAIN SIGNAL CONTROLS OPERATE AS STANDARD.

PRE-SET SHUNT SIGNAL HAS ONLY EMERGENCY REPLACEMENT CONTROLS FOR ASPECT CONTROL, WITH NO ROUTE CONTROLS.

DRAWN BY

TRACED BY JP

CHECKED BY

Southern Region
Chief Signal and Telecommunications Engineer

Typical Interlocking Circuits

Pre set Shunts Explanation
of Method of Operation

 British Rail

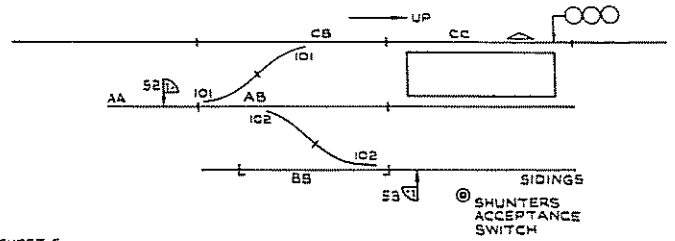
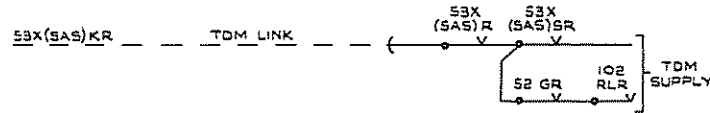
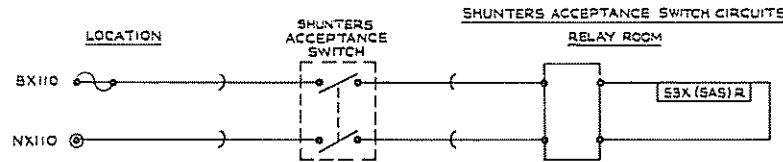
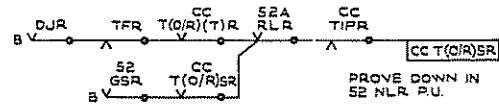
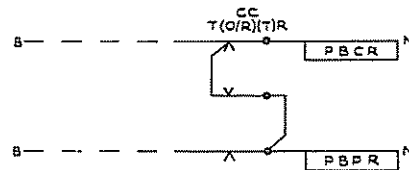
Chief Signal and
Telecommunications Engineer

No
EI-28-30

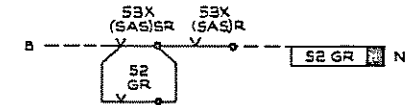
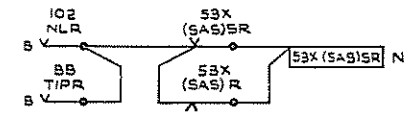
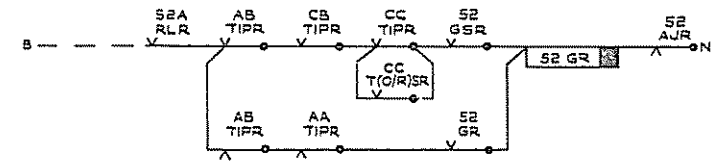
TRACK OVER-RIDE CIRCUITS

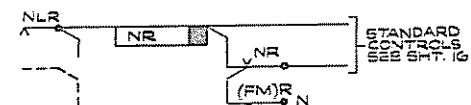


NOTE:
WHEN SHUNT SIGNAL READS
OVER AWS THE INDUCTOR
SHOULD BE CONTROLLED AS
SHOWN ON SHEET 21.

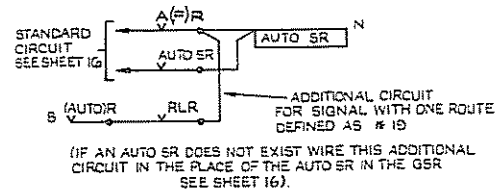


SEE SHEET 5

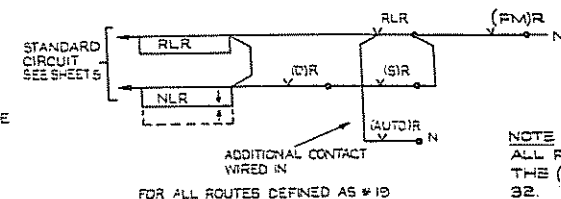




ALL ROUTES
DEFINED AS #18
SIGNALS WITH ONE ROUTE #19, REMAINDER #18



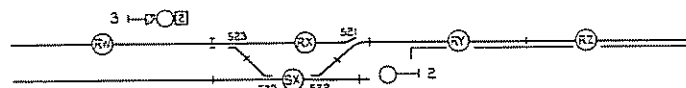
(IF AN AUTO SR DOES NOT EXIST WIRE THIS ADDITIONAL
CIRCUIT IN THE PLACE OF THE AUTO SR IN THE GSR
SEE SHEET 16).



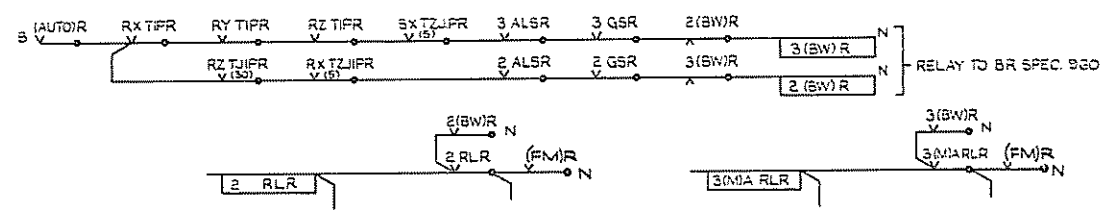
NOTE SIGNALS WITH
ALL ROUTES #18 LOSE
THE (FM)R SEE SH. 32.

THROUGH RUNNING OVERRIDE

- *18 PLACED TO DANGER & MAINTAINED NORMAL BY OVERRIDING CONTROL SWITCH.
- *19 SET TO WORK AUTOMATICALLY BY OVERRIDING CONTROL SWITCH.



- 3(M)A TO SET WHEN RX, RY, RZ CLEAR
SX w 522 REV CLEAR FOR 5 SECS
- 2 TO SET WHEN RZ OCCUPIED FOR 30 SECS.
RX w 523 NOR CLEAR FOR 5 SECS.

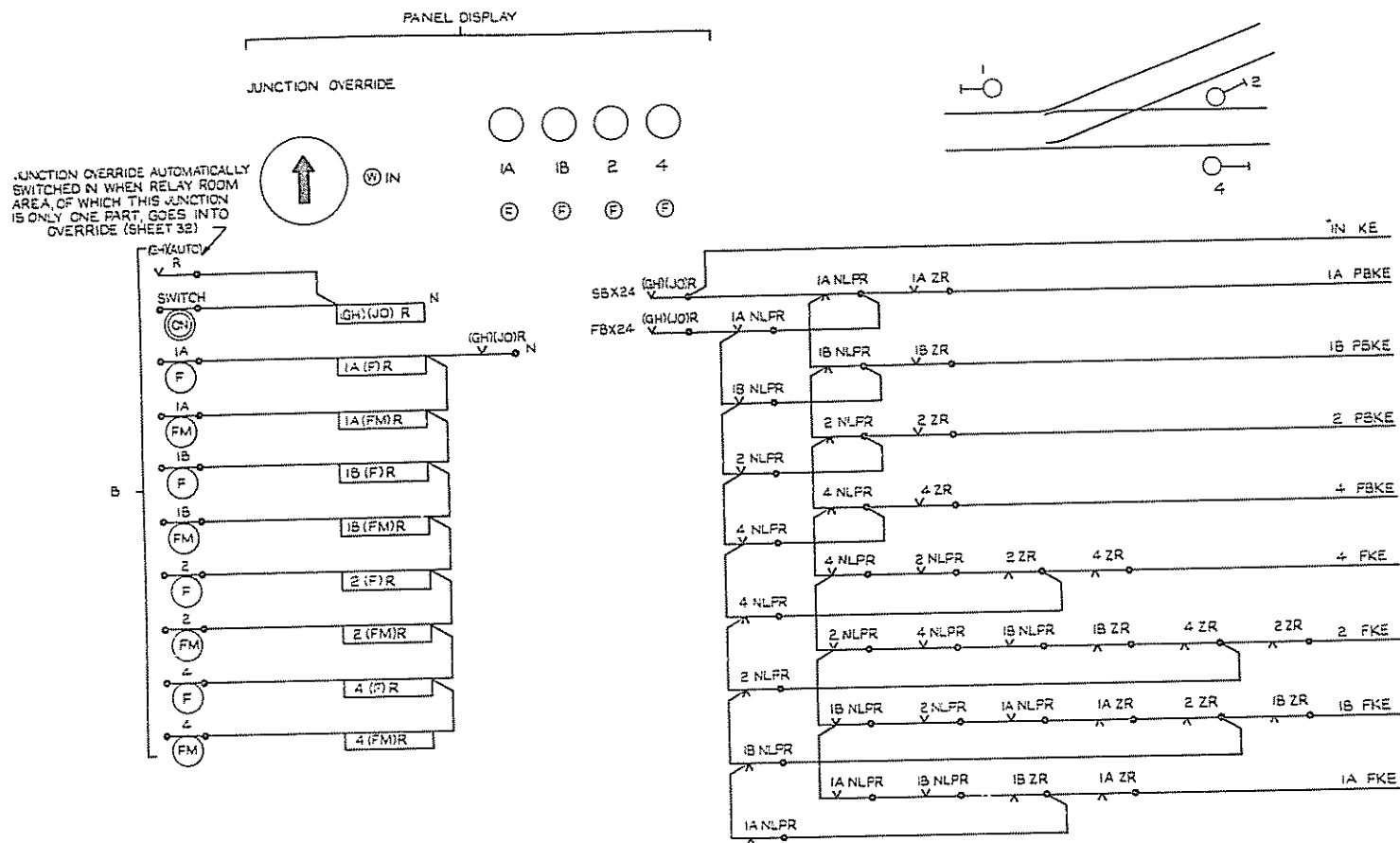


SIGNALMAN'S CONTROL SWITCH TO STATE "BAY PLATFORM WORKING"
IN PLACE OF "OVERRIDE"

AUTO BAY PLATFORM WORKING

VARIATIONS TO THROUGH RUNNING ARRANGEMENT

DRAWN BY	ISSUE 2	Southern Region Chief Signal and Telecommunications Engineer	British Rail
TRACED BY JS	NO ALTERATION FROM ISSUE 1.		
CHECKED BY	ISSUE 3 YR(P) REMOVED. NR cct AMENDED.		
		Typical Interlocking Circuits Override Through Running & Auto Bay Platform Working	Chief Signal and Telecommunications Engineer EI-28-33



AT CERTAIN LOCATIONS THE JUNCTION OVERRIDE AND THROUGH RUNNING OVERRIDE ARE COMBINED
THE (JO)R IS NOT GENERATED AND IN ITS PLACE THE (AUTO)R IS USED. THE 'IN' KE IS NOT PROVIDED.

DRAWN BY: ISSUE 2.
TRACED BY: JS. NO ALTERATION FROM ISSUE 1.
CHECKED BY:

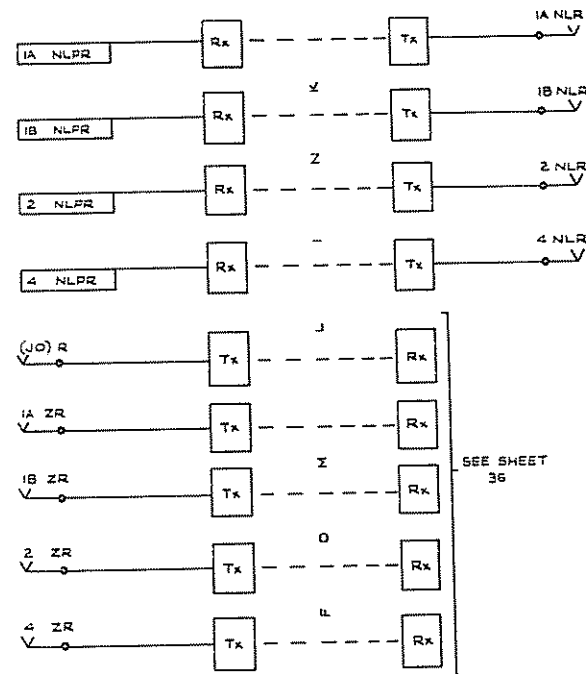
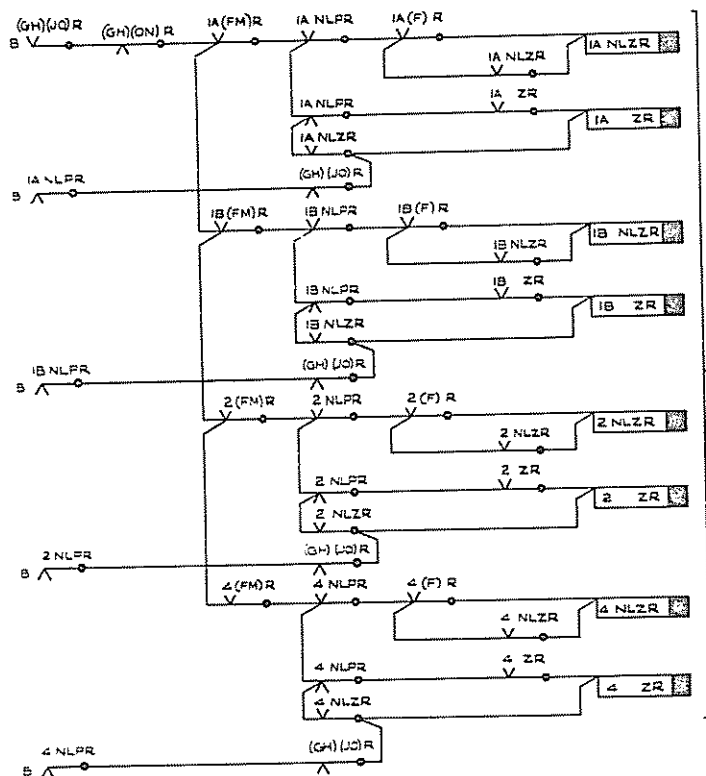
Southern Region
Chief Signal and Telecommunications Engineer

Typical Interlocking Circuits
Override
Controls & Indications At Panel For
Selective Override

British Rail

Chief Signal and
Telecommunications Engineer

EI-28-34



IF THE NORMAL LINK IS F.D.M. THE SELECTIVE OVERRIDE LINK MUST BE IN MULTICORE.

DESIGNED BY
DRAWN BY
CHECKED BY

ISSUE 2
NO ALTERATION FROM ISSUE 1

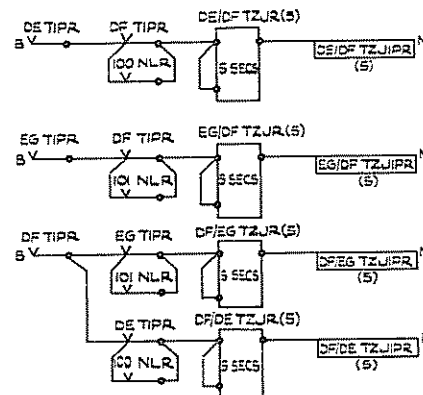
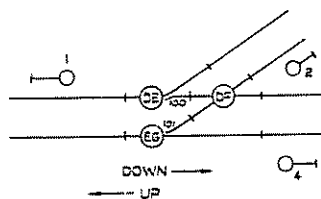
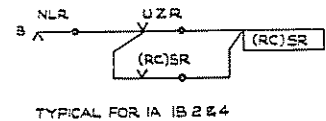
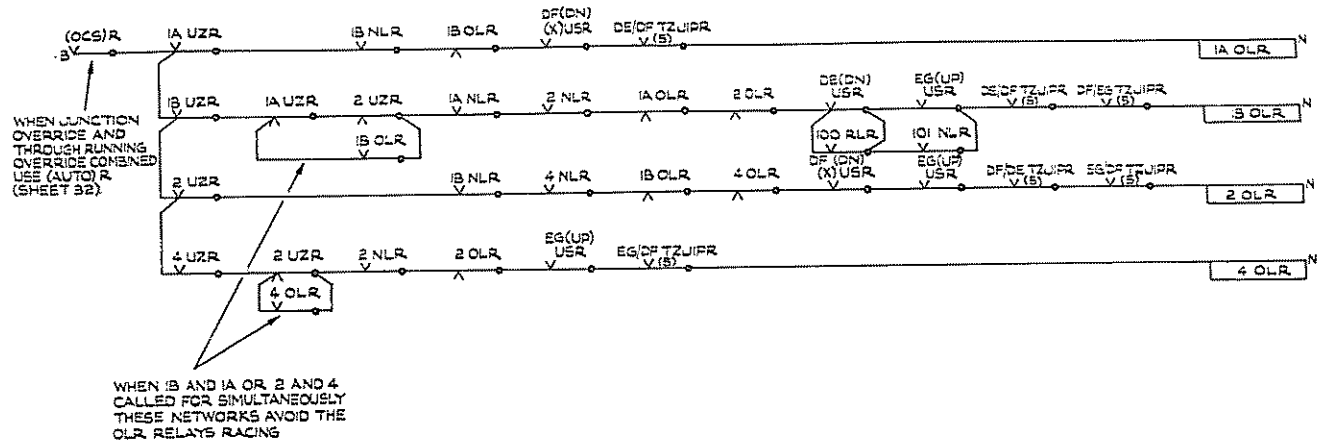
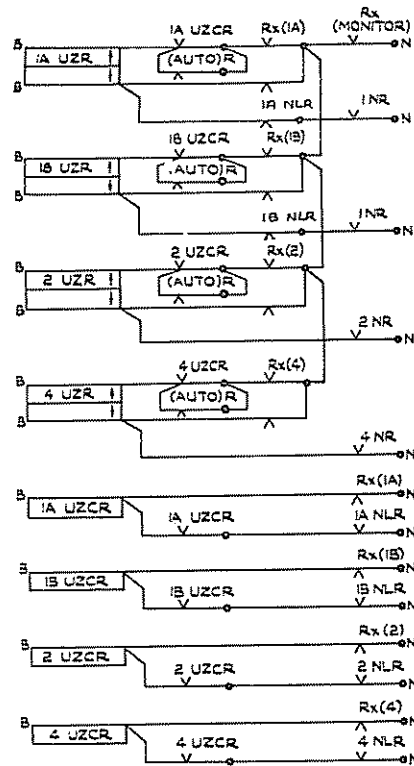
Southern Region
Chief Signal and Telecommunications Engineer

British Rail

Typical Interlocking Circuits
Override
Selective Override Link.

Chief Signal and
Telecommunications Engineer

EI-28-35



FOR DIAGRAM OF JUNCTION USED
SEE SHEET 34

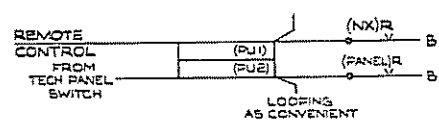
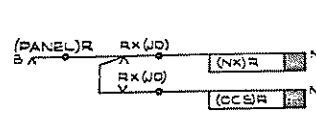
DRAWN BY: ISSUE 2
TIME DELAYS REMOVED
CLERICAL ERRORS CORRECTED
TRACED BY: CS
CHECKED BY: ISSUE 3
(AUTO)R ADDED TO UZR'S
(RC)SR AMENDED

Southern Region
Chief Signal and Telecommunication Engineer
Typical Interlocking Circuits
Override
Selective Override-Interlocking End
Circuits (I)

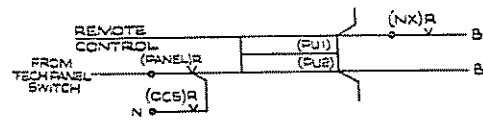
British Rail

Chief Signal and
Telecommunication Engineer

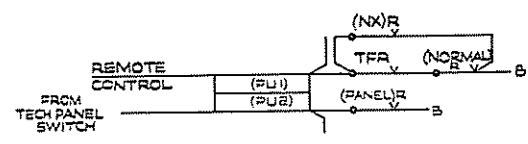
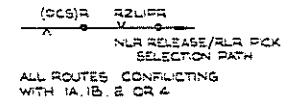
EI-28-36



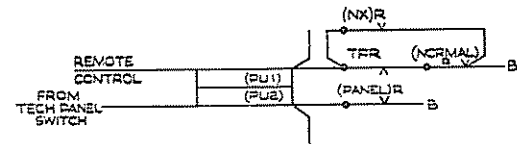
POINT NR RR
ALL POINTS SET BY ROUTES 1A, 1B, 2 OR 4
SIGNALS (F)R A (F)R A (FM)R
ALL SIGNALS WITH ALL ROUTES LOCKED NORMAL
BY EITHER 1A, 1B, 2 OR 4 SET



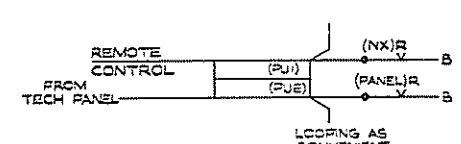
POINT CR
ALL POINTS SET BY ROUTES 1A, 1B, 2 OR 4
(FM)R
FOR 1, 2 & 4



1(F)R, 2(F)R, 4(F)R
WHEN SIGNAL IS ALSO AN EXIT TO ROUTES
WHICH CAN STILL BE SET DURING
JUNCTION WORKING



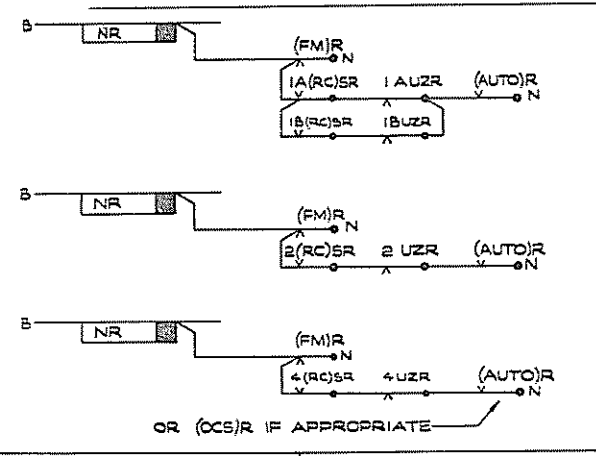
(F)R RELAYS FOR EXIT BUTTON
FOR ROUTES 1A, 1B, 2 AND 4 WHERE
SUCH BUTTON IS REQUIRED AS AN
ENTRANCE TO A ROUTE WHICH CAN STILL
BE SET DURING JUNCTION WORKING



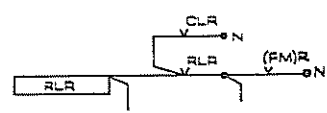
(F)R RELAYS USED FOR SETTING 1A, 1B, 2 OR 4
WHEN SUCH BUTTON NOT REQUIRED FOR ANY
OTHER SETTING DURING JUNCTION WORKING

NOTE POLARITY OF REMOTE
CONTROL DEPENDS ON
TYPE USED.

ALL THE ABOVE ARE REQUIRED WHEN JUNCTION WORKING AND OVERRIDE ARE SEPARATE ITEMS. WHEN COMBINED THE STANDARD
ARRANGEMENTS SHOWN ON SHEET 32 APPLY.



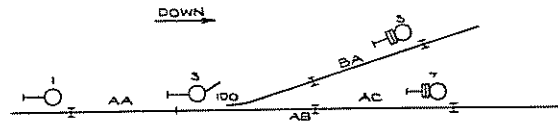
THESE CIRCUITS ARE IN PARALLEL TO THAT SHOWN
ON SHEET 33 (TOP LEFT)



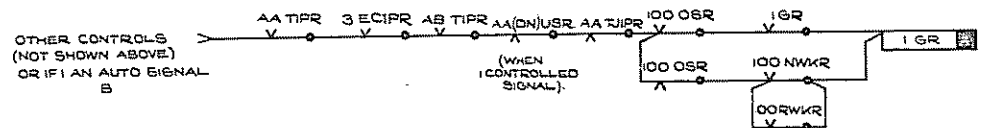
FOR 1A
1B
2
4

IN THIS CIRCUIT THE DLR CONTACT(S) PROVIDE THE SAME CONDITIONS
AS SET UP BY THE (AUTO)R ON SHEET 33 (TOP)

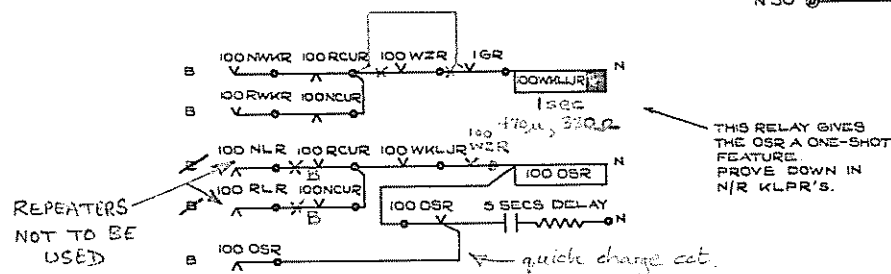
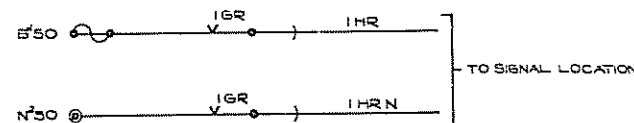
DRAWN BY	ISSUE 2	Southern Region Chief Signal and Telecommunications Engineer	British Rail
TRACED BY	ALTERATIONS TO CIRCUITS SHOWN ON SHEET 33 HIGHLIGHTED IN A BETTER MANNER		
CHECKED BY	ISSUE 3 YR(P) REMOVED NR CIRCUIT AMENDED.		
		Typical Interlocking Circuits Override Selective Override - Interlocking End Circuits (2)	Chief Signal and Telecommunications Engineer E1-28-37



THERE IS NO LOCKING BETWEEN 1 & 100

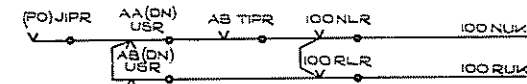


WHEN 1 IS AN AUTO CIRCUIT FOR 1 HR TO BE



AB ROUTE LIGHTS

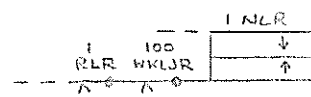
a) 1 CONTROLLED SIGNAL



b) 1 AUTO SIGNAL



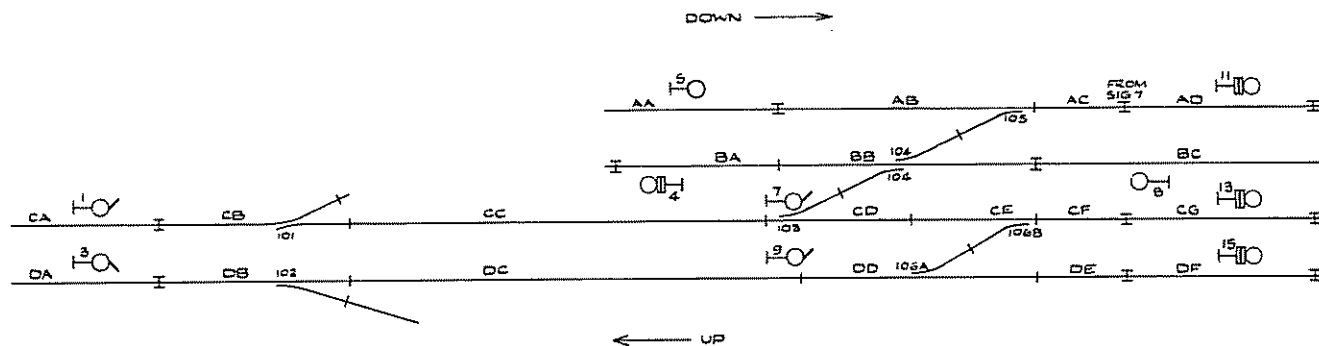
When WZR up, 10/RCUR throws down R/NLR which drops R/NWKR



TO AVOID SLIP ON GR WHEN HINDER PTS. LOCKED BY 2ND SWINGING 9/L.

AND 15/4/83

ISSUED BY.	ISSUE 2.	Southern Region Chief Signal and Telecommunications Engineer	 British Rail
TRAINED BY L.D.S.	CIRCUIT WAS FOR "LAMP OR CONTROLS".		
CHECKED BY	ISSUE 3.		
	OSR CCT AMENDED.	Chief Signal and Telecommunications Engineer	
		Typical interlocking Circuits Swinging Overlaps. 1) Simple Case	EI-28-39

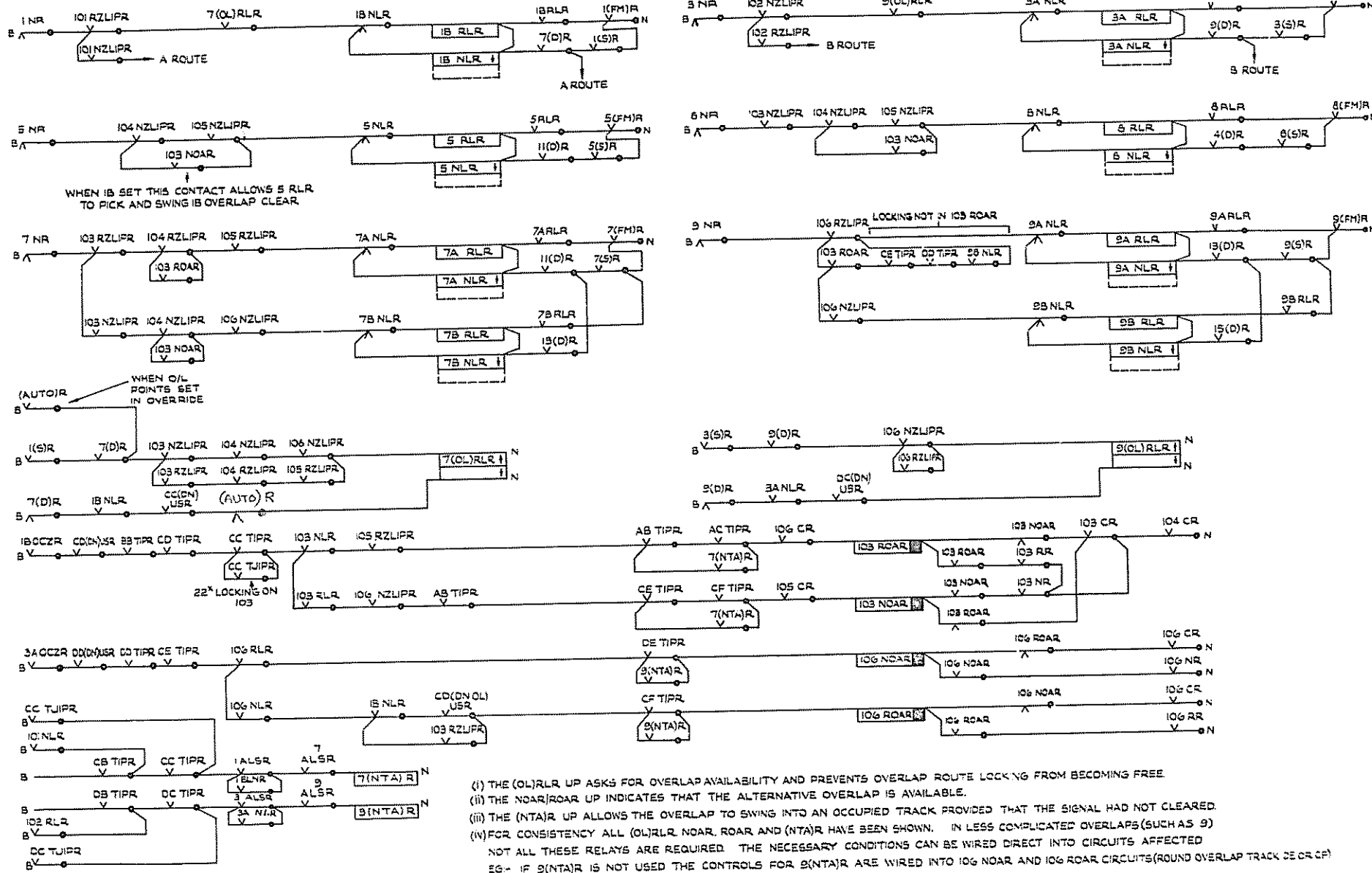


THIS DIAGRAM TO BE USED WITH SHEETS 41 TO 45.

NOTE THAT 104 PRODUCES CASE OF A SET OF POINTS SET
NORMAL WHEN HINGE POINTS NORMAL AND SET REVERSE WHEN
HINGE SET REVERSE IE. THEY MOVE WHEN HINGE MOVES.
- THEY NEED NOT BE ANGLES FOR THIS CONDITION TO OCCUR.

IN ACCORDANCE WITH PRESENT PRACTICE ALL
CONTROL SIGNALS WOULD NOW HAVE SEPARATE
OVERLAP TRACKS.

DRAWN BY	ISSUE 2			Southern Region Chief Signalling & Telecommunications Engineer	British Rail
TRACED BY B.A.H.	NO ALTERATIONS FROM ISSUE 1				
CHECKED BY	ISSUES 3 NOTE RE SEPARATE O/L ADDED.			Typical Interlocking Circuits Swinging Overlaps 2) Complicated Cases Diagram For Circuits	Chief Signalling & Telecommunications Engineer
					EI-28-40



- (i) THE (OL)RLR UP ASKS FOR OVERLAP AVAILABILITY AND PREVENTS OVERLAP ROUTE LOCK'NG FROM BECOMING FREE
- (ii) THE NOAR/ROAR UP INDICATES THAT THE ALTERNATIVE OVERLAP IS AVAILABLE.
- (iii) THE (NTA)R UP ALLOWS THE OVERLAP TO SWING INTO AN OCCUPIED TRACK PROVIDED THAT THE SIGNAL HAD NOT CLEARED
- (iv) FOR CONSISTENCY ALL (OL)RLR NOAR, ROAR AND (NTA)R HAVE BEEN SHOWN. IN LESS COMPLICATED OVERLAPS (SUCH AS 9) NOT ALL THESE RELAYS ARE REQUIRED. THE NECESSARY CONDITIONS CAN BE WIRED DIRECT INTO CIRCUITS AFFECTED
EG- IF 9(NTA)R IS NOT USED THE CONTROLS FOR 9(NTA)R ARE WIRED INTO 106 NOAR AND 106 ROAR CIRCUITS (ROUND OVERLAP TRACK DE CR CP)

BACK CONTACT OF (NTA)R TO BE IN APPROPRIATE 7 CR 3 TASR PICK PATH.

ISSUE 2

LOCKING NOT IN 103 ROAR ADDED TO 9A NLR
CD(CN)USR USED INSTEAD OF 7A NLR, 7B NLR & 6 NLR
DD(CN)USR USED INSTEAD OF 9A NLR & 7B NLR
KEY CALLING ON N/ROAR ALTERED.

ISSUE 3

ALSR ADDED TO (NTA)R.
YR (P)S REMOVED. N/R OARS AMENDED

British Rail
Level Signalling Interlocking Circuits

Typical Interlocking Circuits
Swinging Overlaps
2) Complicated Case
ROUTE RELAYS AND
OVERLAP AVAILABILITY

FOR DIAGRAM SEE SHEET 40

British Rail

Level Signalling Interlocking Circuits

Typical Interlocking Circuits

Swinging Overlaps

2) Complicated Case

ROUTE RELAYS AND

OVERLAP AVAILABILITY

EI-28-41

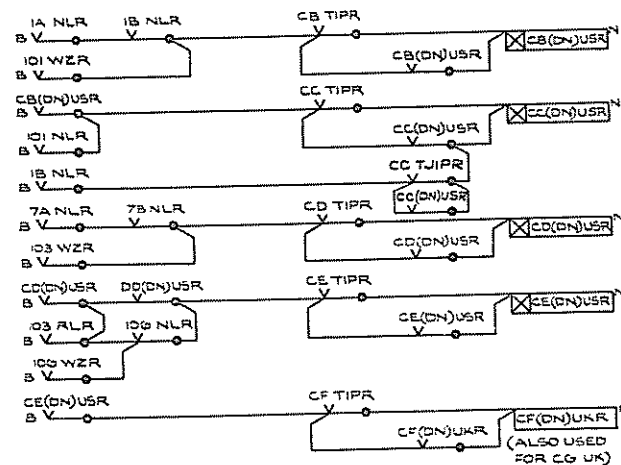
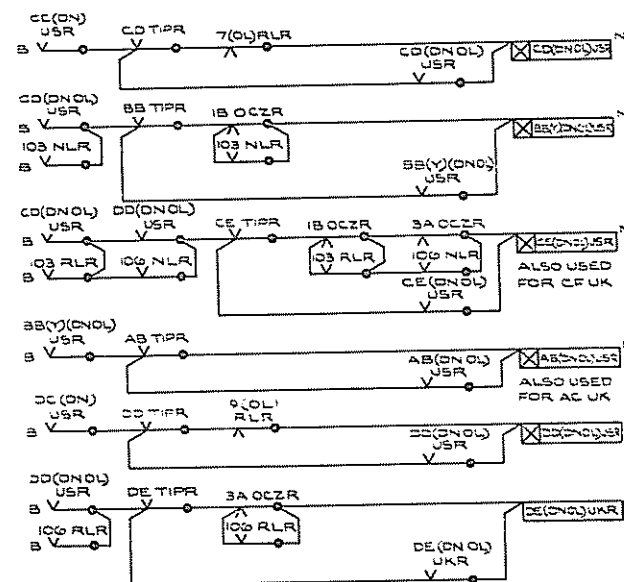
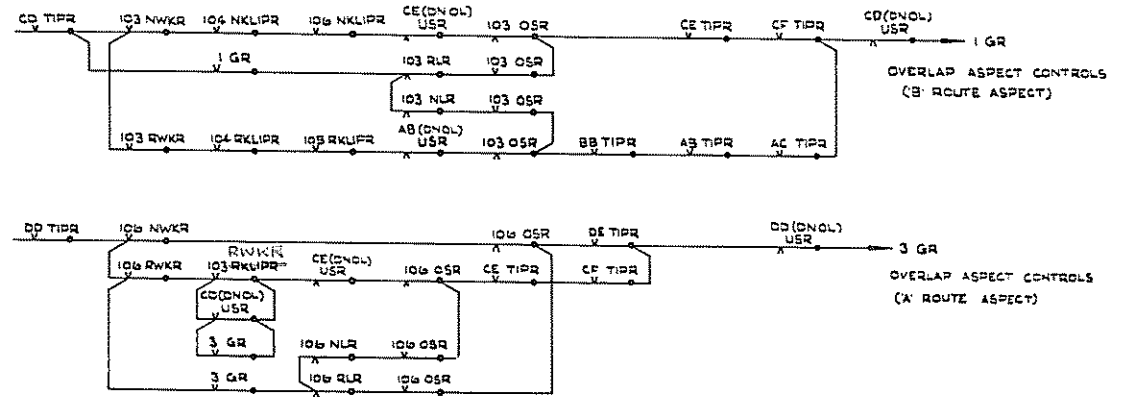
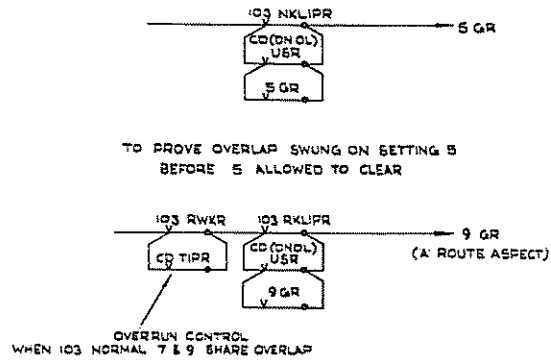


Figure 1 consists of five circuit diagrams, labeled A through E, illustrating the connection of a 100 ohm resistor (R) to various terminals and the use of a 100 ohm resistor (R) in the DB, DC, DD, DE, and DE (also used for DF) lines.

- Diagram A:** Shows a 100 ohm resistor (R) connected to the DB (DN) USR terminal. The resistor is connected to the DB (DN) USR terminal and the DB (DN) USR terminal. The DB (DN) USR terminal is also connected to the DB (DN) USR terminal.
- Diagram B:** Shows a 100 ohm resistor (R) connected to the DC (DN) USR terminal. The resistor is connected to the DC (DN) USR terminal and the DC (DN) USR terminal. The DC (DN) USR terminal is also connected to the DC (DN) USR terminal.
- Diagram C:** Shows a 100 ohm resistor (R) connected to the DD (DN) USR terminal. The resistor is connected to the DD (DN) USR terminal and the DD (DN) USR terminal. The DD (DN) USR terminal is also connected to the DD (DN) USR terminal.
- Diagram D:** Shows a 100 ohm resistor (R) connected to the DE (DN) USR terminal. The resistor is connected to the DE (DN) USR terminal and the DE (DN) USR terminal. The DE (DN) USR terminal is also connected to the DE (DN) USR terminal.
- Diagram E:** Shows a 100 ohm resistor (R) connected to the DE (DN) USR terminal. The resistor is connected to the DE (DN) USR terminal and the DE (DN) USR terminal. The DE (DN) USR terminal is also connected to the DE (DN) USR terminal.



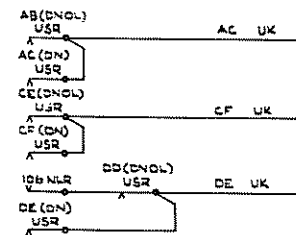
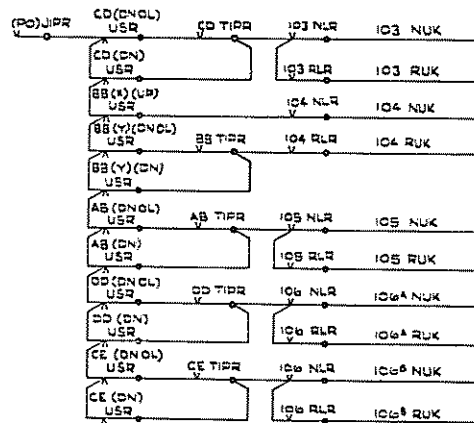
EI-28-44



ALL OTHER ASPECTS HAVE NO SPECIAL CONTROLS

1 GR & 3 GR MUST BE TO BR SPEC 934

ROUTE LIGHTS FOR 103, 104, 105, 106 POINTS AC, CF, DE TRACKS



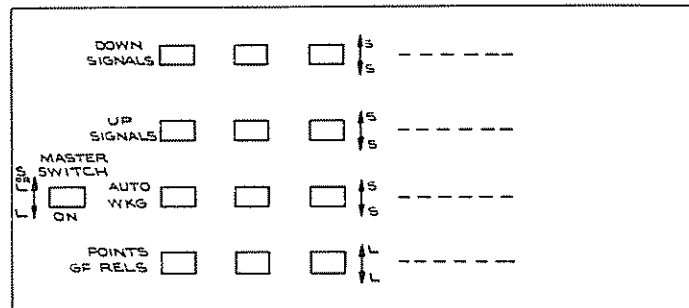
FOR DIAGRAM SEE SHEET 40

ISSUE 2
NO ALTERATION FROM ISSUE 1

Typical Interlocking Circuits
Swinging Overlaps
2) Complicated Case
Special Aspect Controls Also Route Lights

British Rail
EI-28-45



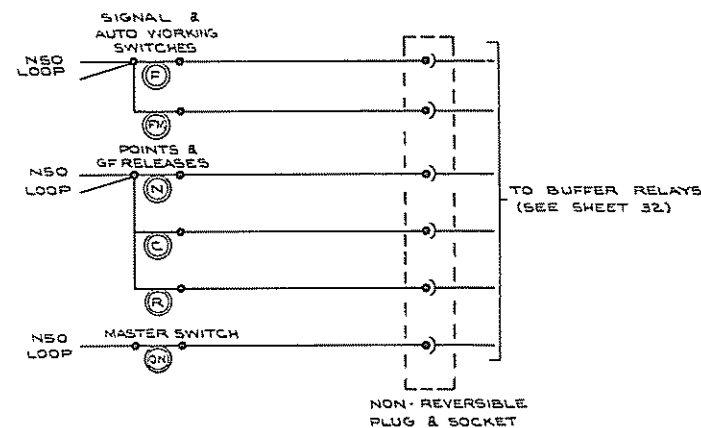


SIGNALS & AUTO WORKING SWITCHES DEPRESS TO MAKE F CONTACT
PUSH UP TO BREAK FM CONTACT

POINTS & GF RELEASES DEPRESS TO MAKE R CONTACT
PUSH UP TO MAKE N CONTACT
RESTORE TO CENTRE TO MAKE C CONTACT

CAPTIVE KEY MASTER SWITCH DEPRESS TO BRING PANEL INTO USE

ALL SWITCHES 3 POSITION
S = SPRUNG LOADED
L = SWITCH STAYS IN POSITION



NON-REVERSIBLE PLUG & SOCKET

WHEN MORE THAN ONE PAIR, EACH PAIR TO BE KEY-CODED TO PREVENT THE WRONG PLUG BEING INSERTED IN A SOCKET

DRAWN BY: **ISSUE 2**
NO ALTERATION FROM ISSUE 1.

TRACED BY: **2**

CHECKED BY:

Southern Region
Chief Signal and Telecommunications Engineer

British Rail

Typical Interlocking Circuits

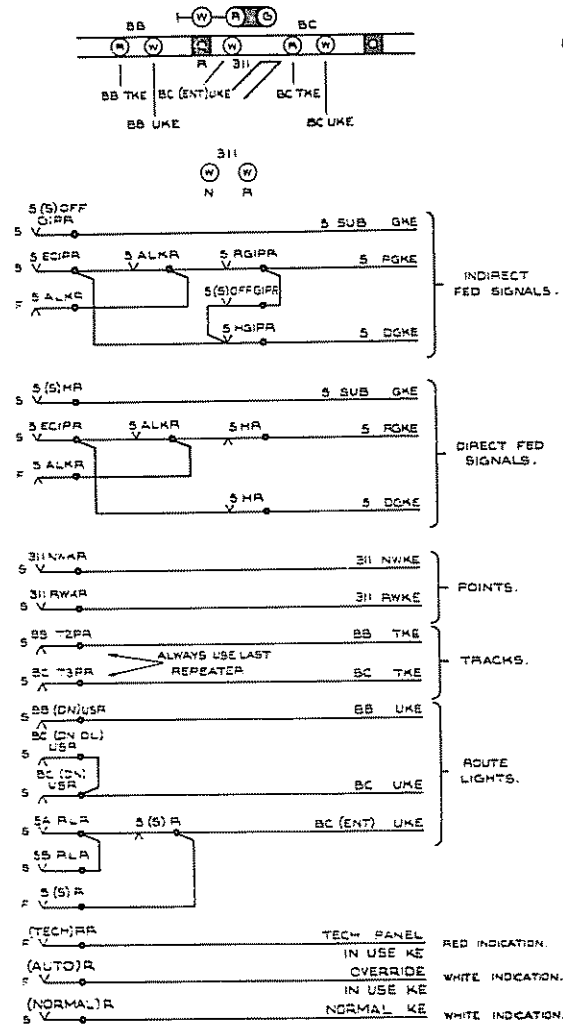
Chief signal and telecommunications engineer

Technician's Test Panel

Route Setting Panel

EI-28-56

ROUTE SETTING MONITORING (REMOTE RELAY ROOMS ONLY) TYPICAL INDICATIONS PROVIDED.



S = STEADY SUPPLY.
F = FLASHING SUPPLY.
ON/OFF SWITCH NOT SHOWN.

BASIC DIAGRAM INDICATIONS:-

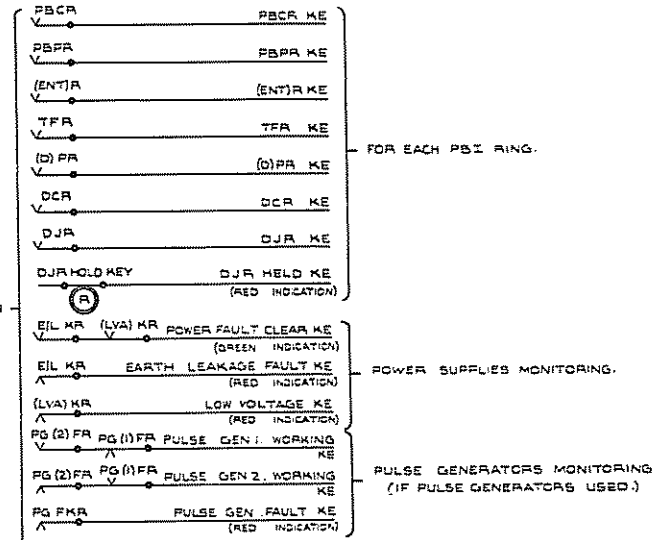
- ONE RED LIGHT FOR EACH TRACK CIRCUIT IN ANY LOCKING CIRCUIT.
- ONE WHITE LIGHT PER TRACK WHEN ROUTE SET OVER THAT TRACK PLUS ONE EXTRA LIGHT IMMEDIATELY PAST EACH CONTROLLED SIGNAL OR SHUNT.
- SIGNAL ON/OFF + SUB INDICATIONS.
- DETECTION N/R INDICATIONS.
- WHICH SYSTEM IS CONTROLLING INTERLOCKING - MAIN BOX, OVERRIDE OR TECH. PANEL.
- INCOMING CONTROLS AFFECTING ROUTE SETTING OR ASPECTS (NOT ASPECT SEQUENCE).
- DIRECTION ARROWS ON REVERSIBLE LINES.

BASIC EQUIPMENT MONITORING

- PBI RING(S).
- POWER SUPPLIES.
- FILAMENT FAILURE INDICATIONS. (IF ANY)

STEADY INDICATION SUPPLY.

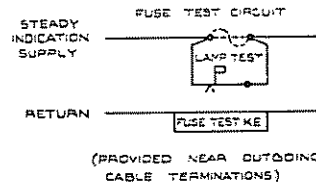
EQUIPMENT MONITORING



AT A MAIN SIGNALBOX THE POWER SUPPLIES MONITORING PANEL WILL PROVIDE INDICATIONS FROM ALL RELAY ROOMS AS WELL. ALSO PROVIDED ARE PULSE GENERATOR FAILED INDICATIONS FROM ALL RELAY ROOMS.

MAIN SIGNALBOX CAPABLE OF RESETTING ALL EARTH LEAKAGE DETECTORS IN ALL RELAY ROOMS (ONE PLUNGER PER RELAY ROOM.)

PLUNGERS ETC. AT RELAY ROOMS: TECHNICIAN'S INDICATIONS ON/OFF SWITCH
PULSE GENERATOR 1 START.
PULSE GENERATOR 2 START
DJR HOLD KEY (ONE PER PBI RING)



ISSUE 2
OVERRIDE AND NORMAL INDICATIONS NOW SHOWN
BASIC DIAGRAM INDICATIONS ADDED.

Southern Region
Chief Signal and Telecommunications Engineer

Typical Interlocking Circuits
Technician's Test Panel
Monitor Panels.

British Rail

Chart Signal and
Telecommunications Engineering

EI-28-57

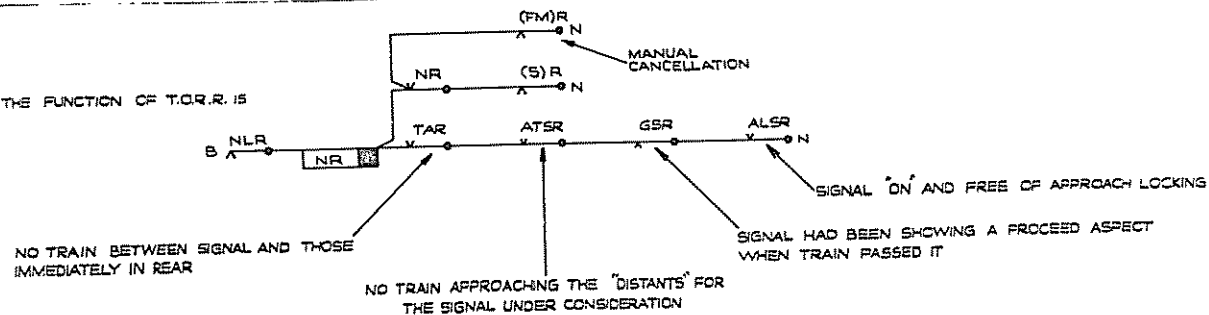
APPENDIX A

TRAIN OPERATED ROUTE RELEASE (T.O.R.R.)

DRAWN BY			Southern Region Chief Signal and Telecommunications Engineer	 British Rail Chief Signal and Telecommunications Engineer For:
TRACED BY				
CHECKED BY				

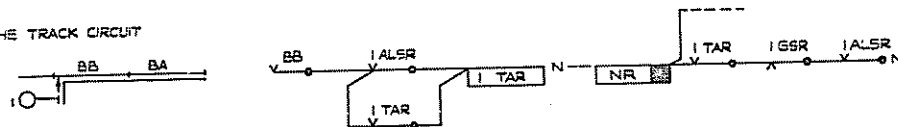
STANDARD CIRCUIT

THE CIRCUIT THAT CARRIES OUT THE FUNCTION OF T.O.R.R. IS

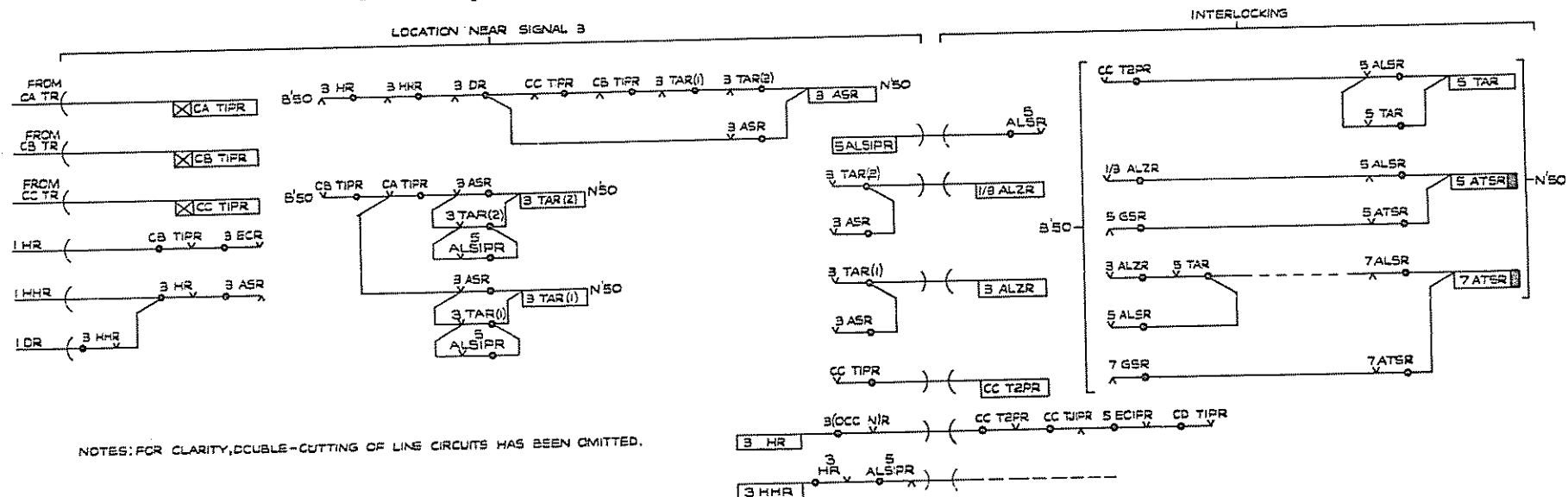
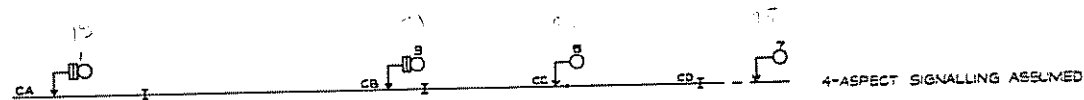


TERMINAL PLATFORM-PLATFORM STARTER

THE LOOK-BACK FEATURE LOOKS ONLY AT THE TRACK CIRCUIT NEAREST TO THE SIGNAL.



FIRST CONTROLLED SIGNAL AFTER AN AUTO



NOTES: FOR CLARITY, DOUBLE-CUTTING OF LINE CIRCUITS HAS BEEN OMITTED.

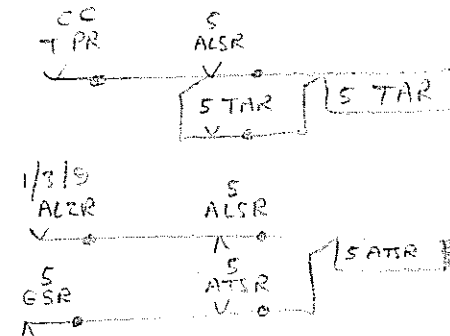
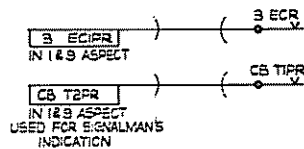
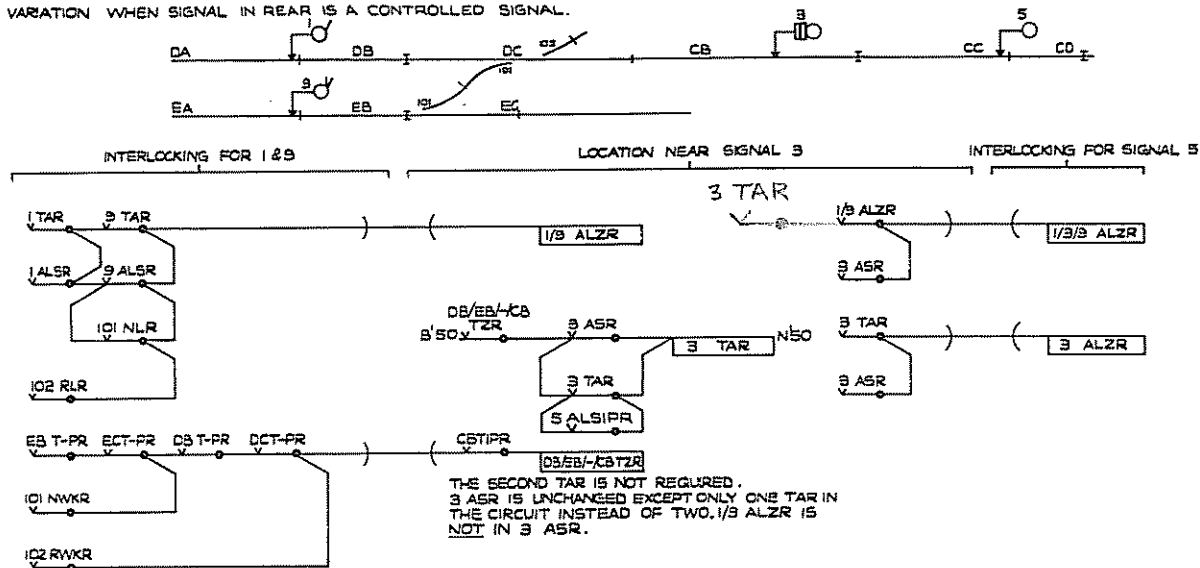
ISSUE 2. TAR'S & NR CIRCUITS AMENDED.
 TRACKED - JAW.
 CHECKED BY:

Typical Interlocking Circuits
 Appendix A-T.O.R.R.

British Rail

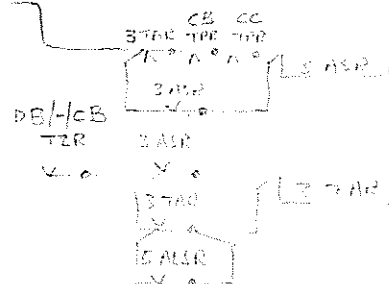
AI

VARATION WHEN SIGNAL IN REAR IS A CONTROLLED SIGNAL.



Same interlocking for 1&2S

3
1/3 1/3 1/3
1/3 1/3 1/3



ISSUE 2	ISSUE 2. 3 TAR & NOTES AMENDED.
Author J.A.W.	
Checker	

Typical Interlocking Circuits
Appendix A-T.O.R.R.

British Rail

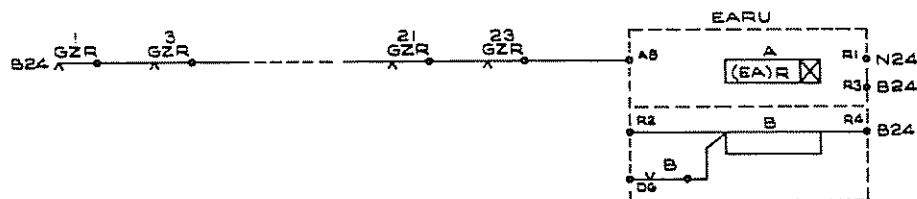
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A2

APPENDIX B
ELECTRONIC ROUTE SELECTION EQUIPMENT (E.R.S.E.)

HOW ERSE WORKS

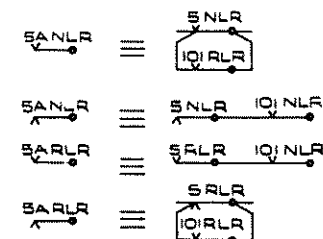
1. WHEN AN ENTRANCE BUTTON IS PUSHED AND RELEASED,
THE APPROPRIATE FZR PICKS TO INITIATE THE FLASHING ENTRANCE INDICATION.
2. ON PUSHING AN EXIT BUTTON,
THE RELEVANT ROUTE CARD CHECKS THAT THE ROUTE IS AVAILABLE
(POINTS FREE OR SET, OPPOSING ROUTES NORMAL, ETC).
3. IF THE ROUTE IS AVAILABLE, ERSE CALLS THE POINTS (NZR OR RZR PICKS).
4. ONCE THE POINT CIRCUITS ARE SET AND LOCKED (WZR DOWN),
ERSE CALLS THE SIGNAL (GZR PICKS).
5. ONE SECOND AFTER RELEASING THE EXIT BUTTON,
THE ERSE OUTPUT RELAYS (FZR, GZR, NZRS & RZRS) DROP.
THE SIGNAL RLR SHOULD HAVE STUCK OVER ITS OWN FRONT CONTACT.
6. IF THE EXIT BUTTON IS HELD DOWN FOR MORE THAN 5-30 SECS,
OR A FAULT OTHERWISE KEEPS THE GZR ENERGISED,
THE (EA)R PICKS TO WARN THE SIGNALMAN.
ONE ERSE ALARM RELAY UNIT (EARU) IS PROVIDED PER PUSH-BUTTON RING.
THE INPUT TO IT IS OVER BACK CONTACTS OF ALL GZRS (OR REPEATER) IN SERIES:-



CONTACT ARRANGEMENT AND
TYPICAL APPLICATIONS
ON DRWG E152-23.

CONVERTING CONVENTIONAL CIRCUITS FOR USE WITH ERSE

1. WITH ERSE, POINTS ARE SET AND LOCKED BEFORE, RATHER THAN AFTER, THE SIGNAL RLR IS PICKED.
(ERSE WILL NOT OPERATE THE SIGNAL RLR UNTIL THE POINT WZR INPUTS ARE REMOVED).
2. WITH ERSE, THERE IS NO SEPARATE NLR/RLR FOR EACH ROUTE.
IN PLACE OF THE ROUTE NLR/RLR CONTACTS IN CONVENTIONAL CIRCUITS,
POINT NLR/RLR FRONT CONTACTS SHOULD BE USED IN CONJUNCTION WITH
THE APPROPRIATE SIGNAL/CLASS NLR/RLR CONTACTS.
EG. IF 5A ROUTE ALONE REQUIRES 10I POINTS NORMAL:-
3. WHERE APPROPRIATE, BORUS MAY BE USED IN PLACE OF CONVENTIONAL
METAL TO METAL CONTACT RELAYS. FOR CONTACT LOADING PURPOSES,
3 BORU RELAYS ARE EQUIVALENT TO 6 BR930 SPEC RELAYS.



PYM
JR

ISSUE 3
NEW SHEET

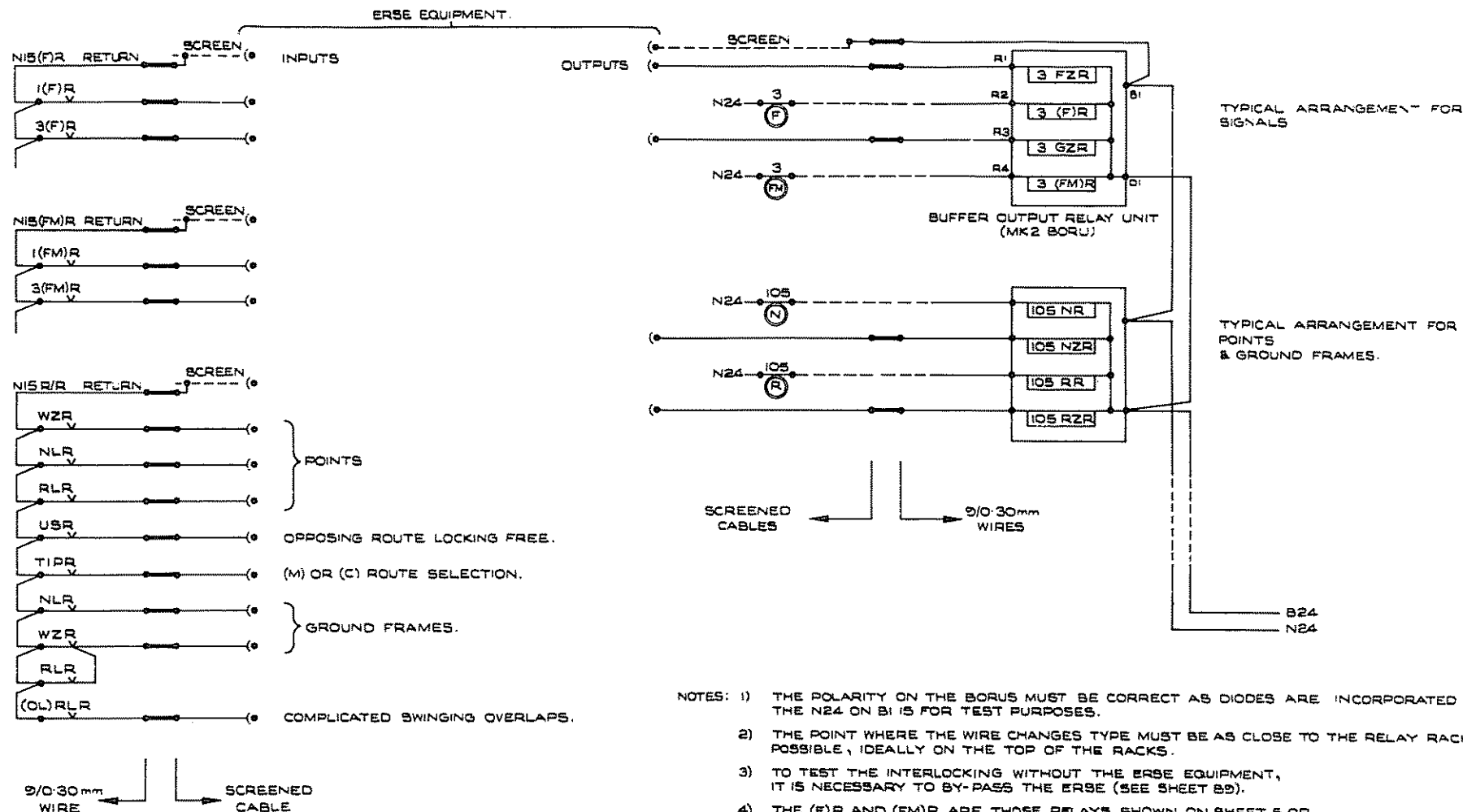
Author: B. J. J.
Chief Signalman: J. J. J.

British Rail

Typical Interlocking Circuits Appendix B-ERSE

Method Of Operation
Variations To Conventional Circuits.

E1-28-B1



- NOTES:
- 1) THE POLARITY ON THE BORUS MUST BE CORRECT AS DIODES ARE INCORPORATED IN THEM THE N24 ON B1 IS FOR TEST PURPOSES.
 - 2) THE POINT WHERE THE WIRE CHANGES TYPE MUST BE AS CLOSE TO THE RELAY RACKS AS POSSIBLE, IDEALLY ON THE TOP OF THE RACKS.
 - 3) TO TEST THE INTERLOCKING WITHOUT THE ERSE EQUIPMENT, IT IS NECESSARY TO BY-PASS THE ERSE (SEE SHEET B9).
 - 4) THE (F)R AND (FM)R ARE THOSE RELAYS SHOWN ON SHEET 5 OR SHEET 32 AS APPROPRIATE. THE BUTTON (F) CONTACT MAY FEED THE ERSE INPUT DIRECTLY, PROVIDED IT IS INDEPENDANT OF THE (FM) CONTACT.
 - 5) MK2 BORUS HAVE TWO DEPENDENT CONTACTS PER RELAY- F/A/B A5/A4/A3 A8/A7/A6 SIMILARLY FOR B/C AND D BANKS, PLUS A/F ON A1/A2 & C1/C2 ONLY.
 - 6) ON SMALL SYSTEMS, THE (FM) AND R/R NIS RETURNS MAY BE COMBINED. OTHERWISE, THE (F), (FM) AND R/R NIS RETURNS MUST BE SEPARATE.
 - 7) THE ERSE SHOULD BE EARTHED AT ONE POINT ONLY (SEE HANDBOOK FOR DETAILS).

P.M.
32.

ISSUE 3
NOTES AMENDED FOR
MK2 BORU.
NEW SHEET.

Typical Interlocking Circuits Appendix B - ERSE

ERSE Inputs & Outputs.

EI-28-B2

SHEET 3: PANEL INDICATIONS.

THE PBK(F) IS FED OVER AN FZR FRONT CONTACT

SHEET 5: PUSH BUTTON CIRCUITS.

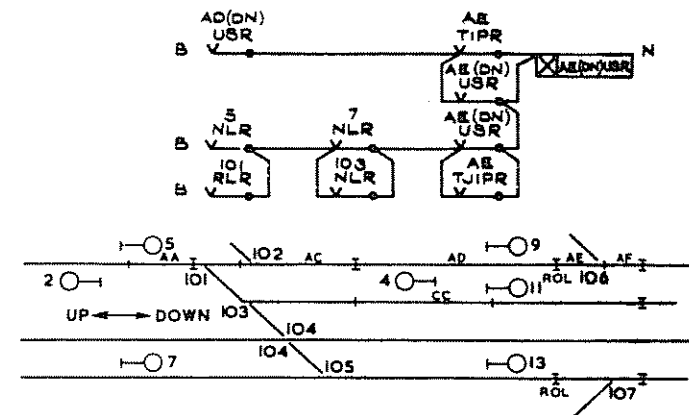
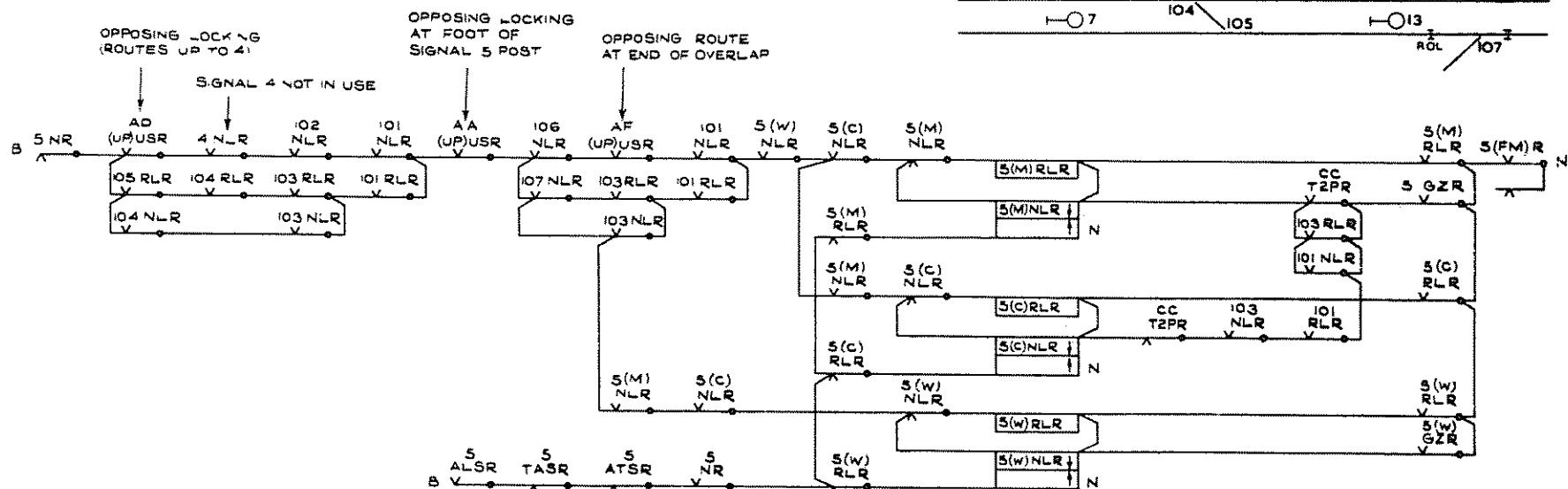
THE (S)R, (D)R, (ENT)R, (D)PR, DZR, PBPR, PBCR, DJR, DCR, TFR, ARE NOT REQUIRED.
THE (F)R, (FM)R, NR AND RR (BUT NOT CR) MAY HAVE METAL TO METAL CONTACTS.

SHEET 6: ROUTE RELAYS.

SIGNAL NLR CONTACTS MAY REQUIRE CONDITIONING ON POINTS, EG. AE (DN) USR BECOMES:-
THE WZR CONTACTS ARE NOT REQUIRED IN THE USR CIRCUITS (POINTS ARE SET BEFORE
ROUTE SETS).

ONE NLR/RLR IS USED FOR ALL ROUTES FROM A SIGNAL.
WHERE A ROUTE HAS MORE THAN ONE CLASS, A SEPERATE
NLR/RLR IS PROVIDED FOR EACH CLASS.

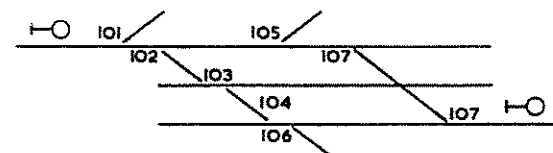
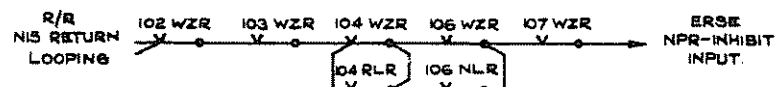
EXAMPLE .- ROUTES FROM SIGNAL 5 = 5(M)A. 5(W)A. 5(M)B. 5(C)B. 5(M)C. 5(W)C.



DRAWN BY P J M	ISSUE 3		Southern Region Chief Signal and Telecommunications Engineer	 British Rail
TRACED BY L D S	YR (P) REPLACED BY NR		Typical Interlocking Circuits Appendix B-ERSE Variations To Conventional Circuits Sheets 3.5.6.	
CHECKED BY	SHEET REDRAWN.			
			Chief Signal and Telecommunications Engineer:	No. EI-28-B3

SHEET 7: PREFERRED ROUTES.

AN ADDITIONAL ERSE INPUT IS REQUIRED TO INHIBIT EACH NON-PREFERRED ROUTE IF THE PREFERRED ROUTE IS AVAILABLE. ERSE THEN SETS THE PREFERRED OR NON-PREFERRED ROUTE AUTOMATICALLY.



PREFERRED ROUTE : 101 (102) (103) (104) - 106 107.
NON-PREFERRED ROUTE (NPR): 101 102 103 - 105 - (107).

NOTES:

1. THE NPR WILL ONLY SET IF ANY OF THE PREFERRED ROUTE POINTS ARE LOCKED AND INCORRECTLY SET.
2. 104 & 106 APPEAR ONLY IN THE PREFERRED ROUTE. THE INPUT INCLUDES 104 & 106 FREE OR SET FOR PREFERRED ROUTE.
3. 102, 103, 107 ARE REQUIRED IN DIFFERENT POSITIONS BY THE TWO ROUTES. THE NPR INPUT INCLUDES THE POINTS FREE ONLY. AS THE STANDARD INPUTS WILL INHIBIT THE NPR IF 102, 103 OR 107 ARE SET AND LOCKED FOR THE PREFERRED ROUTE.
4. 101 IS REQUIRED NORMAL IN BOTH ROUTES, SO DOES NOT AFFECT SELECTION OF PREFERRED OR NON-PREFERRED ROUTE.

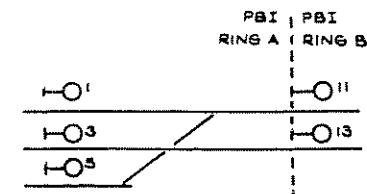
DRAWN BY	PJM	ISSUE 3.			Southern Region Chief Signal and Telecommunications Engineer	 British Rail
TRACED BY	L.D.S.	SHEET REDRAWN.				
CHECKED BY						
			Typical Interlocking Circuits Appendix B-ERSE Variations To Conventional Circuits Sheet 7			

SHEET 11: RING SPLIT AT SIGNAL.

SEPARATE ERSE RACKS ARE REQUIRED FOR EACH RING.
FUNCTIONS CAN BE TRANSFERRED BETWEEN RELAY ROOMS BY TDM OR DIRECT WIRE.
THE TDM MUST BE OF IMMEDIATE ACCESS TYPE AND OF HIGH BAUD RATE.
TRANSMISSION TIME (VIA MAIN S.B. IF NECESSARY) MUST BE LESS THAN 500ms.

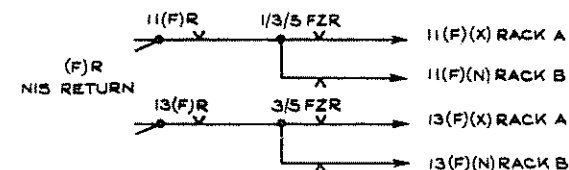
SIMPLE INTERFACE (INTERNAL TO ERSE).

ERSE MK2/2 MONITORS CAN COPE WITH UP TO 8 SIGNALS LEADING TO ONE "SHARED" BUTTON.
11(F) IS FED TO RACK 'A', WHERE IT IS USED AS AN EXIT. IF 1, 3 OR 5 ARE NOT REGISTERED
AS AN ENTRANCE, 11(F) IS THEN PASSED VIA THE MONITOR UNITS TO RACK 'B'
FOR USE AS AN ENTRANCE.
WHERE THE TWO ERSE RACKS ARE HOUSED IN THE SAME CABINET, THE CONNECTION IS
ACHIEVED INTERNALLY THROUGH THE MONITOR LINK CABLE.
ONLY TWO INTERFACES OF THIS TYPE CAN BE ACHIEVED INTERNALLY WITHIN AN ERSE UNIT.



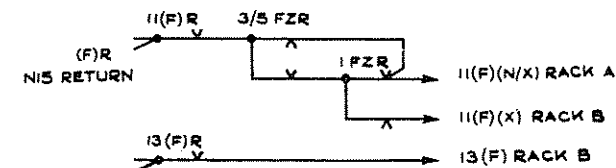
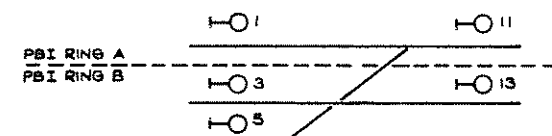
COMPLEX INTERFACE (EXTERNAL TO ERSE).

FOR MORE COMPLICATED RING SPLITS (SEE DIAGRAM), EXTERNAL CIRCUITRY IS REQUIRED:-
WHEN 3 OR 5 ARE REGISTERED AS AN ENTRANCE (FZR UP), 13(F) IS FED TO RACK 'A'
AS AN EXIT—OTHERWISE IT IS FED TO RACK 'B' AS AN ENTRANCE. MK2/3 MONITORS
CAN BE USED TO COMBINE UP TO 8 FZs TO GIVE ONE OUTPUT, ALTERNATIVELY
DUPLICATE FZ OUTPUTS CAN BE LINKED TOGETHER AT THE TERMINAL BLOCKS.
(SEE HANDBOOK FOR FURTHER DETAILS).



SHEET 12: RING SPLIT THROUGH POINTS.

THIS IS ACHIEVED IN A SIMILAR MANNER. IF 3 OR 5 ARE REGISTERED
AS AN ENTRANCE (FZR UP), 11(F) IS FED AS AN EXIT TO RACK 'B'.
IF BOTH 1 AND 3 ARE REGISTERED AS ENTRANCES, PRIORITY
IS GIVEN TO SETTING THE ROUTE WITHIN THE SAME RING,
(i.e. 11(F) IS FED TO RACK 'A').



DRAWN BY PXM	ISSUE 3.	Southern Region Chief Signal and Telecommunications Engineer	British Rail
TRACED BY L.D.S.	FURTHER DETAIL ON RING SPLITS ADDED.	Chief Signal and Telecommunications Engineer	
CHECKED BY	SHEET REDRAWN.	Typical interlocking Circuits Appendix B-ERSE Variations To Conventional Circuits Sheets 11 & 12	No EI-28-B5

SHEET 13 POINT LOCK RELAYS

THE POINT NLR/RLR CIRCUITS ARE ALTERED THUS:
THE FRONT CONTACTS OF ROUTES LOCKING POINTS
NORMAL OR REVERSE ARE ONLY REQUIRED IF THE
LOCKING IS NOT ACHIEVED BY USRs.
THE NZLIPR & RZLIPR RELAYS ARE NOT REQUIRED.
IF NOTE 7 APPLIES, ALTERATIONS ARE AS SHOWN
ON SHEET B6.

SHEET 16 ROUTE RELEASING

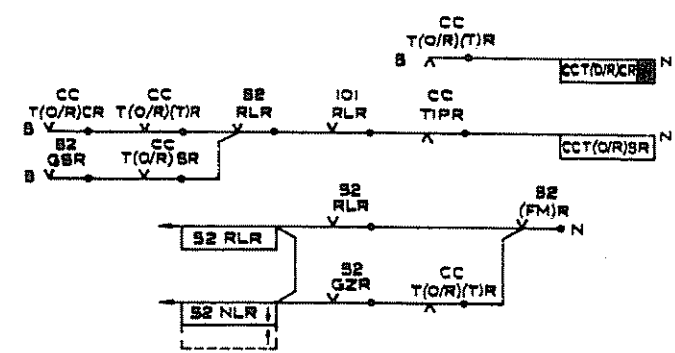
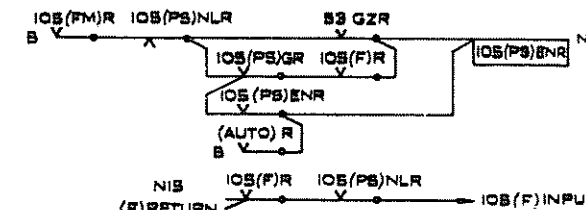
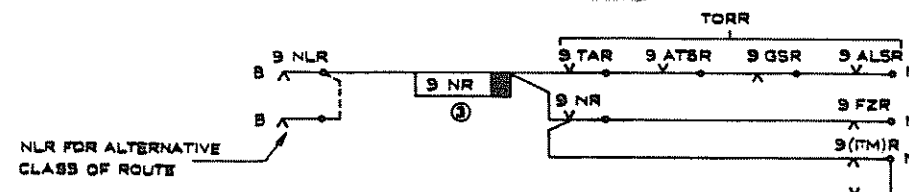
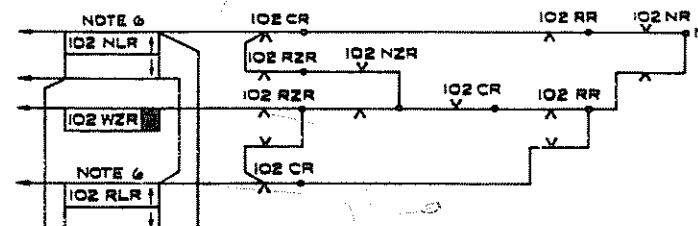
THE NR BECOMES:-

SHEET 29 PRESET SHUNTS

IF THE 'A' ROUTE IS PROVIDED, IT REQUIRES A SEPARATE
ERSE GZR OUTPUT (53(S)AGZR) AND NLR/RLR. OTHERWISE
THE SIGNAL NLR/RLRs ARE ALTERED AS SHOWN FOR
SHEET 6 (ie ONE NLR/RLR COVERS BOTH 'B' & 'C' ROUTES).
IOS(F) ERSE INPUT AND IOS(Ps) ENR ARE ALTERED THUS :-

SHEET 31 TRACK OVERRIDE

CC T(O/R)(T)R & 52GR CIRCUITS REMAIN AS SHOWN. OTHER
CIRCUITS ARE REPLACED THUS:-
ERSE IS PREVENTED FROM SETTING THE ROUTE IF
THE TRACK OVERRIDE BUTTON IS PULLED:-



DRAWN BY	PJM	ISSUE 3
THE DATE	20	YR(P) REPLACED BY NR
THE AUTHOR		SHEET REDRAWN

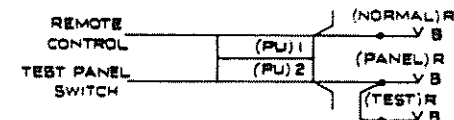
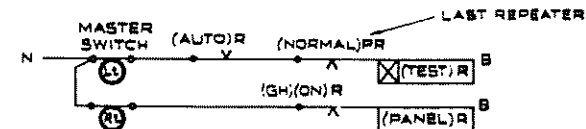
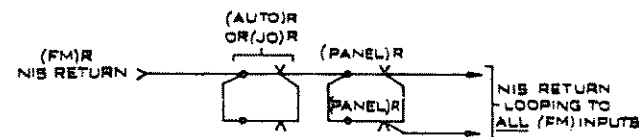
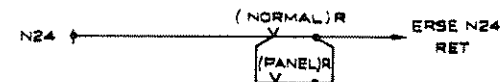
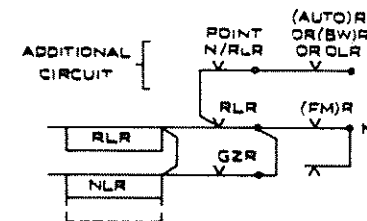
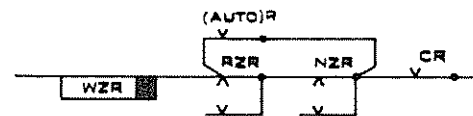
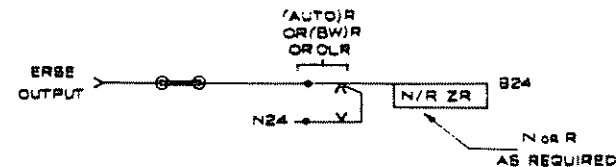
SHEETS 32-37: OVERRIDE

AS THE ROUTE RLR DOES NOT CALL THE POINTS AS IT DOES IN CONVENTIONAL CIRCUITS, THE POINTS MUST ALSO BE CALLED IN OVERRIDE. AN ADDITIONAL FEED IS PROVIDED TO THE NZR/RZR THUS:-
THE WZR CIRCUIT MUST BE ALTERED THUS:-

WHERE A SIGNAL HAS MORE THAN ONE ROUTE (EVEN IF ONLY ONE IS USED IN OVERRIDE) THE (AUTO)R, (BW)R OR OLR MUST BE PREVENTED FROM PICKING THE SIGNAL RLR UNTIL THE POINTS ARE SET CORRECTLY:-

THE ERSE MUST BE PREVENTED FROM RESPONDING WHEN IN OVERRIDE. IN ADDITION, WHEN OVERRIDE OR THE TECHNICIANS PANEL IS SWITCHED INTO OR OUT OF USE, THE ERSE IS RESET. WHERE THERE IS MORE THAN ONE N24 OR (FM) LOOP, THE CIRCUIT MUST BE REPEATED IN EACH.

A THIRD POSITION IS PROVIDED ON THE TECHNICIANS PANEL MASTER SWITCH, TO ENABLE TESTING OF THE ERSE WHEN IN OVERRIDE. THE (FIR) CIRCUIT (SHEET 32) IS ALTERED THUS:-
(SIMILARLY, THE (FM)R FOR SIGNALS WITH ALL ROUTES #18)



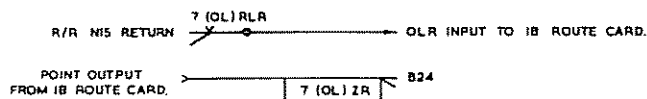
DRAWN BY FM	ISSUE 3			Southern Region Chief Signal and Telecommunications Engineer	 British Rail
TRACED BY 2d	ERSE INHIBIT ADDED				
CHECKED BY	SHEET REDRAWN				
		Typical Interlocking Circuits Appendix B – ERSE Variations To Conventional Circuits Sheets 32 To 37			Chief Signal and Telecommunications Engineer
					No E1 – 28 – B7

SHEETS 40 - 45 COMPLICATED SWINGING OVERLAPS.

WHEN A SET OF POINTS ARE PART OF A SWINGING OVERLAP,
THE "POINTS FREE" INPUT TO THE ERSE MUST BE
ADJUSTED THUS:

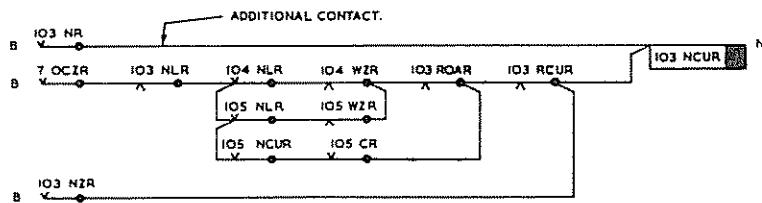
THE OVERLAP POINTS ARE ALREADY SET BEFORE THE SIGNAL IS CALLED - SO THE NOAR/ROAR CONTACTS IN THE SIGNAL NLR/RLR CIRCUITS (SHEET 41) ARE NOT REQUIRED THE SIGNAL NLR/RLR CIRCUITS ARE OTHERWISE ALTERED AS THOSE ON SHEET 6.

THE (OL) RLRs ARE ALTERED, eg 7 (OL) RLR BECOMES:
ERSE REQUIRES AN INPUT FROM THE (OL) RLR TO PROVE
AN OVERLAP IS AVAILABLE, AND CALLS AN OVERLAP
RELAY AT THE SAME TIME AS THE POINTS IN THE ROUTE.

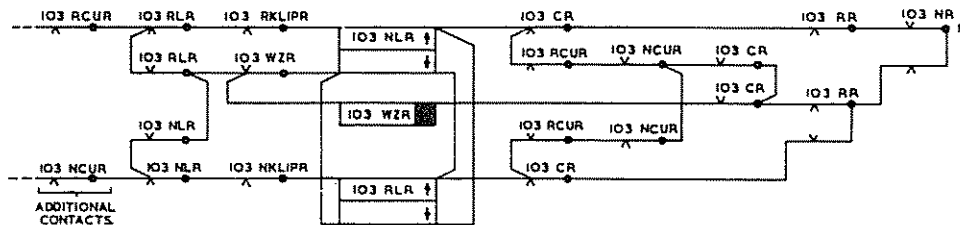
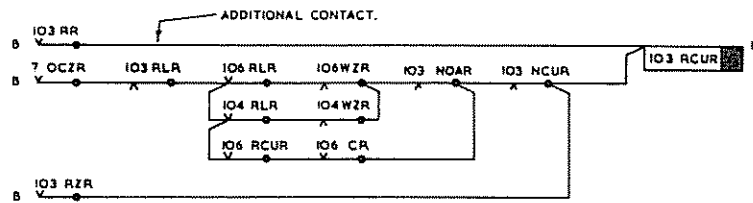
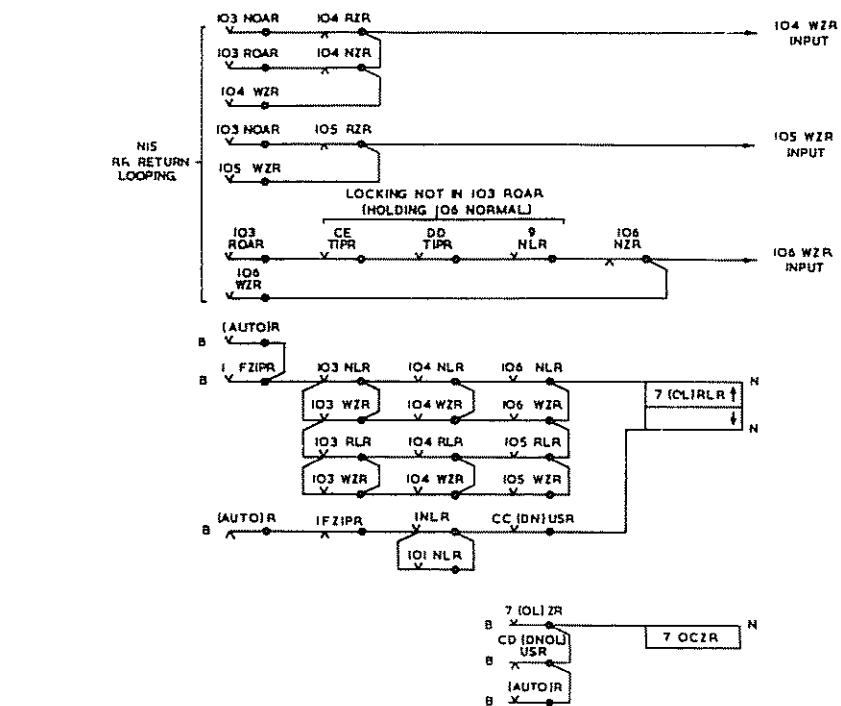


THE OCZR_s ARE ALTERED, eg IB OCZR BECOMES 7 OCZR THUS:

THE OVERLAP CALL TO THE HINGE POINTS IS REMOVED ONCE THE
POINTS HAVE SET (TO ALLOW THE WZR TO PICK) THUS:



THE POINT NLR/RLR CIRCUITS ARE ALTERED FOR
ALL POINTS IN THE OVERLAP,
eg FOR 103 POINTS:-



DRAWN BY <i>PJM</i>	ISSUE <u>3</u>
TRACED BY <i>my</i>	CIRCUITS CORRECTED
CHECKED BY	SHEET REDRAWN

**Southern Region
Chief Signal and Telecommunications Engineer**

Typical Interlocking Circuits.
Appendix B - ERSE

Variations To Conventional Circuits.
Sheets 40 To 45.



British Rail

Chief Signal and
Telecommunications Station Engineer

No
EI - 28 - B8

SHEET 57: TECHNICIANS TEST PANEL

AS THE PBI MONITORING IS DONE WITHIN THE ERSE, ONLY AN INDICATION FROM THE (EA) R IS REQUIRED.
BC (ENT) UKE BECOMES:-

EXTRA: ERSE BY-PASS

TO ENABLE THE RELAY INTERLOCKING TO BE TESTED INDEPENDENTLY OF THE ERSE ROUTE CHECKING, A BY-PASS UNIT IS REQUIRED. THIS ENABLES ROUTES TO BE SET BY KEYING THE POINTS MANUALLY AND CALLING THE SIGNAL RLR BY PRESSING THE ENTRANCE BUTTON. TO ACHIEVE THIS, THE INPUT AND OUTPUT CABLES ARE UNPLUGGED FROM THE ERSE AND PLUGGED INSTEAD INTO THE BY-PASS UNIT. INSIDE THE BY-PASS UNIT, THE ENTRANCE (F) INPUTS ARE WIRED DIRECTLY TO THE APPROPRIATE FZR & GZR OUTPUTS:-

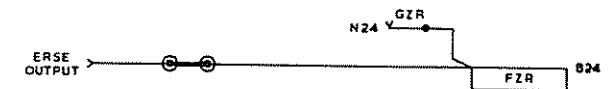
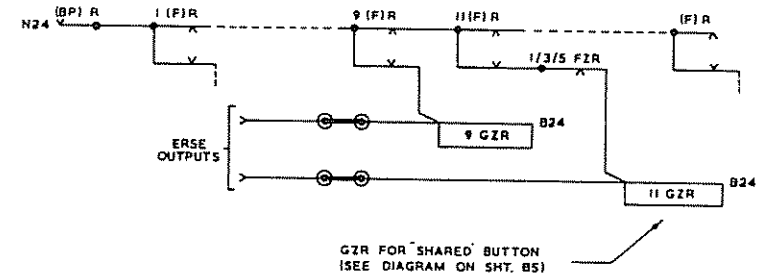
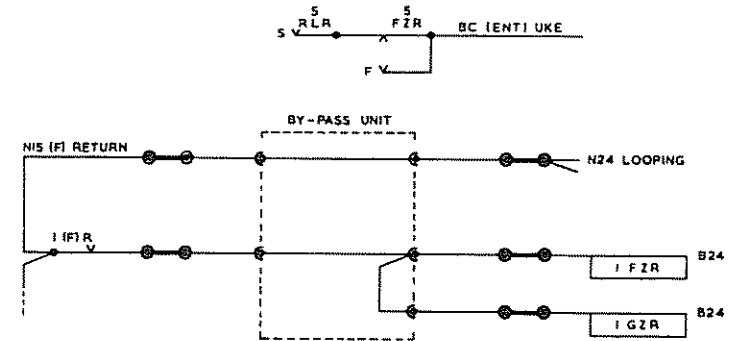
ALTERNATIVELY, BY-PASS CIRCUITS MAY BE PERMANENTLY WIRED, CONTROLLED BY A SWITCH ON THE SIGNALMAN'S OR TECHNICIAN'S PANEL:-
BACK CONTACTS OF THE (BP)R ARE USED TO DISABLE THE ERSE BY DISCONNECTING THE N24 INPUTS AND (FM) NIS RETURN.

CHANGE-OVER CONTACTS OF THE (F)Rs ARE THEN USED TO OPERATE THE GZRs DIRECT, THUS:-

WHERE BOTH (M) AND (W) ROUTES EXIST, THE (W) GZRs MAY BE OPERATED DIRECTLY BY THE REG. 5 EXIT BUTTON IN BY-PASS. HOWEVER, IN COMPLICATED CASES, A TEMPORARY SWITCH MAY BE REQUIRED DURING TESTING.

WHEN A BUTTON IS SHARED BETWEEN TWO PUSH-BUTTON RINGS, ONLY ONE OF WHICH IS IN BY-PASS, IT MAY BE NECESSARY TO PREVENT THE BUTTON FROM OPERATING IN BY-PASS MODE IF IT IS REQUIRED AS AN EXIT IN ENTRANCE / EXIT MODE.

THE FZR'S ARE PROVIDED WITH AN EXTRA FEED THUS:-



DRAWN BY <i>PDM</i>	ISSUE 3		Southern Region Chief Signal and Telecommunications Engineer	British Rail
TRACED BY <i>[Signature]</i>	NEW SHEET		Typical Interlocking Circuits. Appendix B - ERSE	Chief Signal and Telecommunications Engineer
CHECKED BY			Variations To Conventional Circuits. Sheets 57 & By-pass.	No
				EI - 28 - B9

APPENDIX C GROUND FRAMES

DRAWN BY TRACED BY CHECKED BY			Southern Region Chief Signal and Telecommunication Engineer	 British Rail
				Chief Signal and Telecommunication Engineer
				E1-28 C

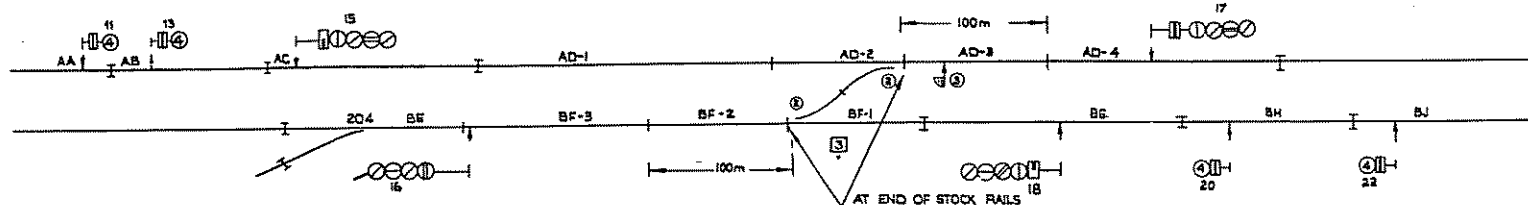
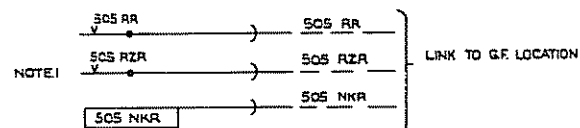
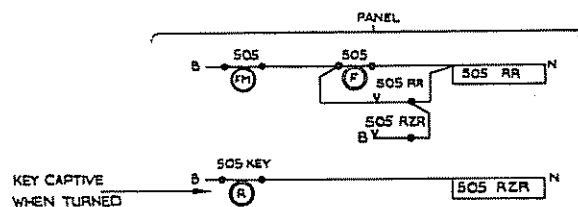


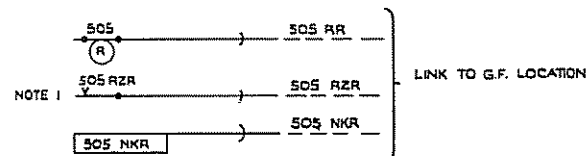
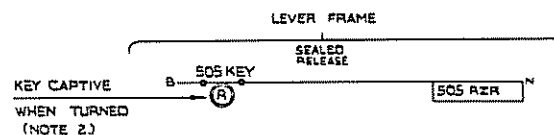
DIAGRAM
NOT TO SCALE

BOLSOVER GF
NOS. SHOWN THIS :- ①
ELEC. REL. - ② SOS
EMERGENCY RELEASE
PROVIDED.

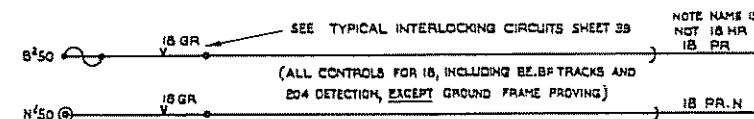
RELAY ROOM
HOUSING INTERLOCKING FOR 16 SIGNAL



INDICATIONS AS FOR GROUND FRAME
INSIDE CONTROLLED SIGNALS
(SUBSTITUTE SOS RR FOR SOO RKR)



INDICATION & BACKLOCK AS FOR
GROUND FRAME INSIDE CONTROLLED SIGNALS



NOTE NAME IS
NOT 16 PR
16 PR

(ALL CONTROLS FOR 16, INCLUDING BE, BF TRACKS AND
204 DETECTION, EXCEPT GROUND FRAME PROVING)

TO/ FROM
GROUND
FRAME
LOCATION



FROM
BE TR
LOCATION

NOTES:-

1. THIS CIRCUITRY REQUIRED ONLY WHEN GROUND FRAME IS ALSO AN EMERGENCY/ENGINEER'S GROUND FRAME.
2. THIS KEY TO BE KEPT IN GLASS FRONTED UNIT LOCKED BY A 221 PADLOCK. (SIMILAR TO THAT USED FOR HOUSING RELAY ROOM KEYS.)

DRAWN BY

TRAILED BY

CHECKED BY

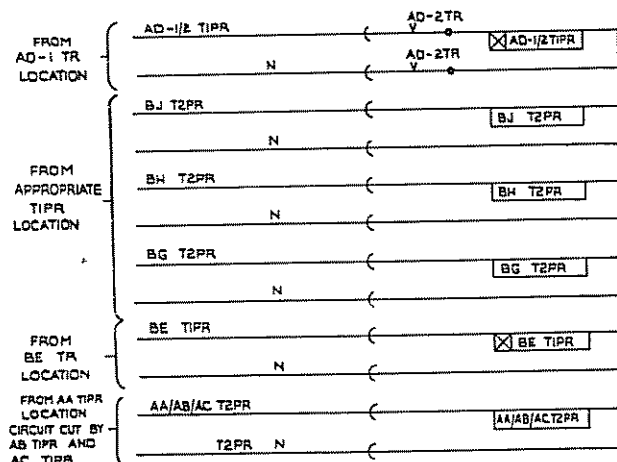
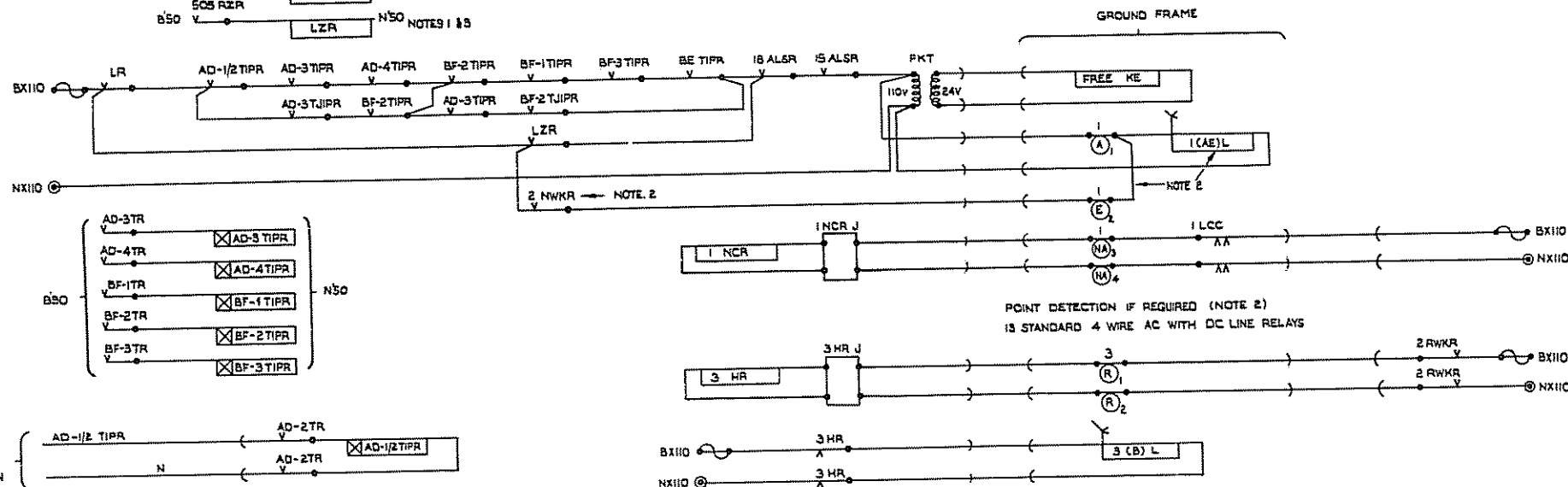
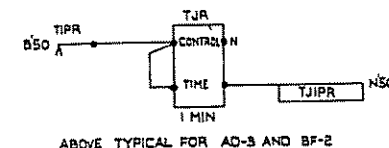
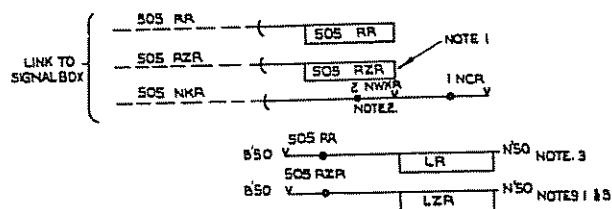
Southern Region
Chief Signal and Telecommunications Engineer

British Rail

Ground Frames
Traffic Type Protected by
Semi Auto Signal (s)
SignalBox and Relay Room Circuits

Chief Signal and
Telecommunications Engineer

EI - 28 C3



NOTES:-

THE CIRCUITS ABOVE ASSUME THAT THE GROUND FRAME IS ALSO USED FOR EMERGENCY/ENGINEER'S PURPOSES, HAS ELECTRICAL DETECTION AND A SIGNALLED MOVE WHEN CERTAIN OF THESE FEATURES ARE NOT REQUIRED THE FOLLOWING ALTERATIONS TO BE MADE.

- NOTE 1. THE RZR, LZR, CIRCUITS AND THE LZR, ROUND THE NORMAL RELEASE ON 1(A) L ARE NOT REQUIRED WHEN THERE IS NO EMERGENCY RELEASE.
- NOTE 2. THE (E) LOCK IS NOT REQUIRED WHEN THE GROUND FRAME POINTS ARE NOT ELECTRICALLY DETECTED. ELECTRICAL DETECTION IS REQUIRED ONLY WHEN SIGNAL ② IS PROVIDED OR THERE IS A SIGNALLED MOVE FACING OVER THE POINTS WHEN NORMAL OR POINTS ARE POWER OPERATED.
- NOTE 3. THE LR AND THE LZR ARE REQUIRED ONLY TO PROVIDE SUFFICIENT CONTACTS. IF THE RR AND THE RZR HAS SUFFICIENT VITAL CONTACTS, THEN THEY MAY BE USED IN PLACE OF THE LR, AND LZR.
- NOTE 4. IF POINTS ARE FACING OR POWER OPERATED, NORMAL DETECTION IS REQUIRED IN IS AND IS ASPECTS

DRAWN BY

TRACED BY

CHECKED BY

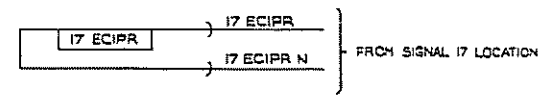
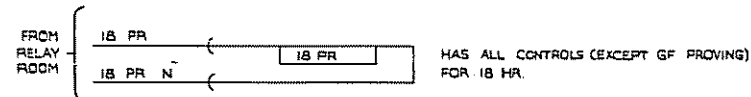
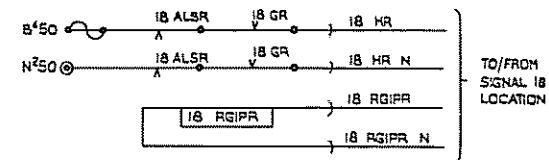
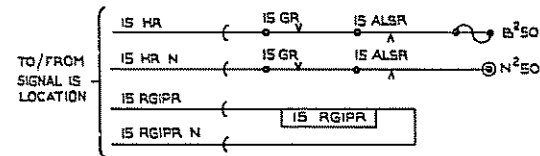
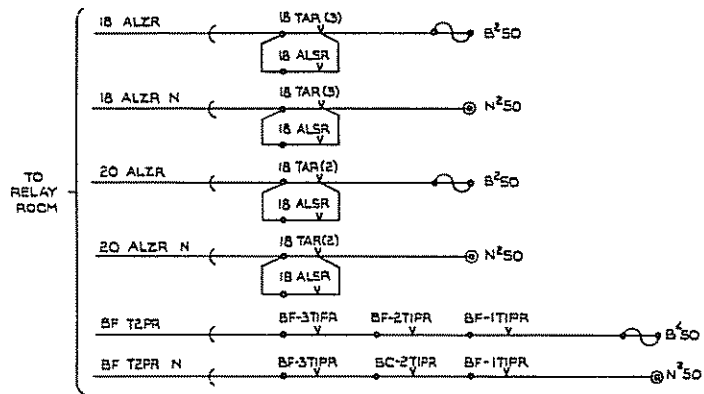
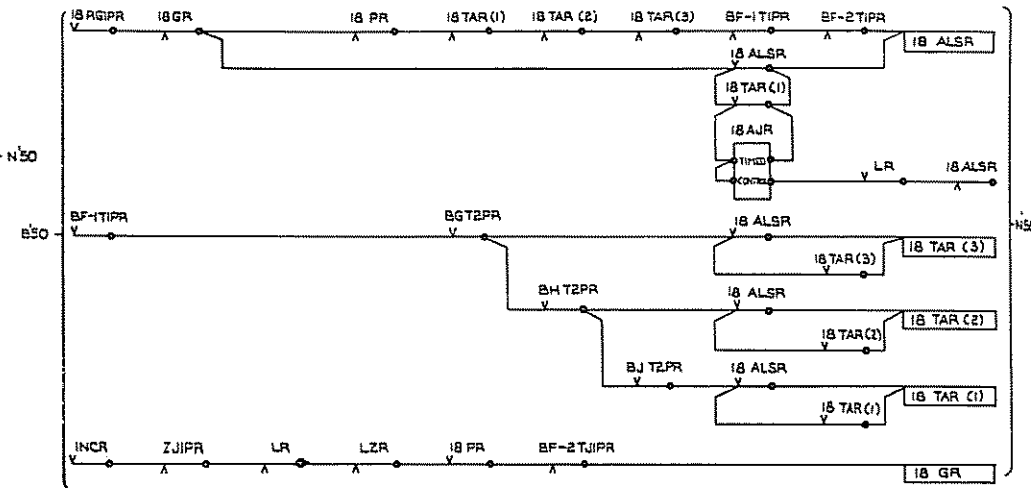
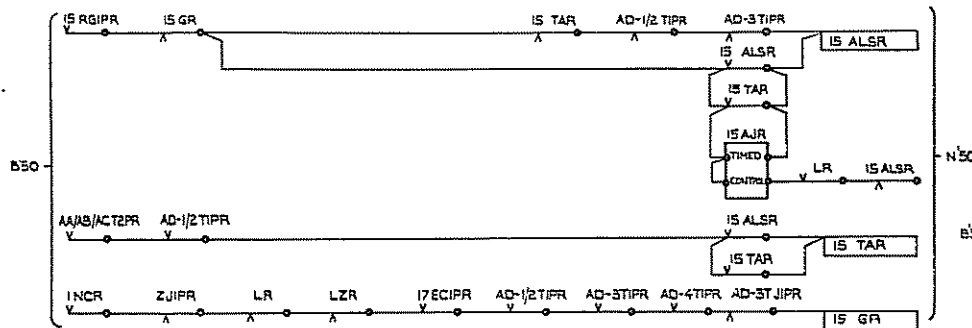
Southern Region
Chief Signal and Telecommunications Engineer

British Rail

Ground Frames
Traffic Type Protected by
Semi - Auto Signal (s)
Ground Frame Circuits (i)

Chief Signal and
Telecommunications Engineer

EI-28 C4



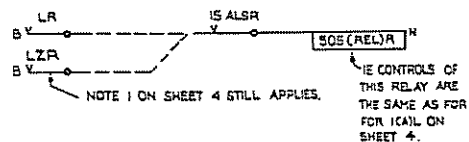
DRAWN BY	
TRACED BY	CS
CHECKED BY	

Southern Region Chief Signal and Telecommunications Engineer
Ground Frames Traffic Type Protected by Semi Auto Signal (S) Ground Frame Circuits (2)

British Rail
Chief Signal and Telecommunications Engineer
EI-28 C5

FROM INTERLOCKING (500 (REL) R)

TRAFFIC TYPE INSIDE CONTROLLED SIGNALS
(SEE SHEET 2)

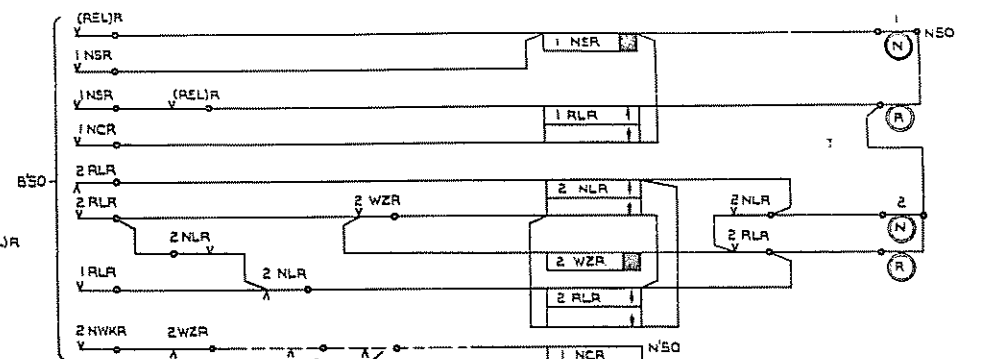


TRAFFIC TYPE PROTECTED BY SEMI-AUTOS
(SEE SHEET 4).

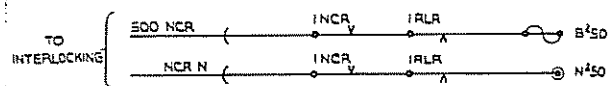
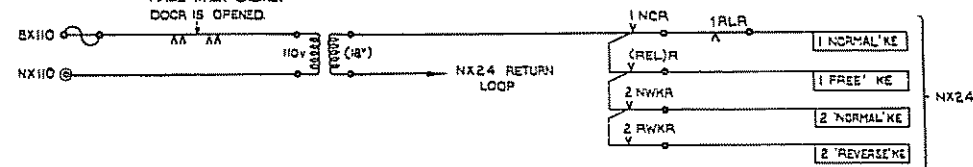
ON THIS SHEET SUBSTITUTE ZJWR FOR THE CONTACTS
OF THE (REL) R IN INSR, 1RLR PICK-UP, 1FREE KE

EMERGENCY/ENGINEERS TYPE
(SEE SHEET 6).

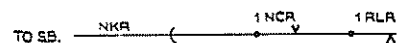
THE VARIATIONS ON THE CONTROLS OF THE (REL) R
DUE TO CLASSIFICATION OF GROUND FRAME.



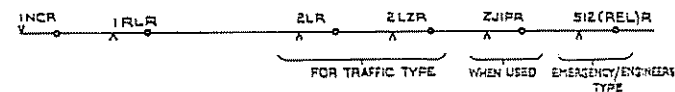
ECONOMISING CONTACT
MADE WHEN CABINET
DOOR IS OPENED.



GROUND FRAME PROVING LINE CIRCUITS TO INTERLOCKING, FOR
TRAFFIC TYPE INSIDE CONTROLLED SIGNALS. (SEE SHEET 1)



GROUND FRAME PROVING AND INDICATIONS TO SIGNAL BOX
FOR OTHER TYPES (SEE SHEETS 3 TO 6)



EXTRACT OF SIGNAL CONTROLS — GR FOR TRAFFIC TYPE (SHEET 5).
— NR LINE OR 512 NCR (DOUBLE-CUTTING REQUIRED)
FOR EMERGENCY/ENGINEERS TYPE (SHEET 6).

ISSUE 2
1RLR ADDED TO
SIGNAL CONTROLS.

Southern Region
Chief Signal and Telecommunications Engineer

Ground Frames
Additional / Altered Circuits for
Two Switch Ground Frames

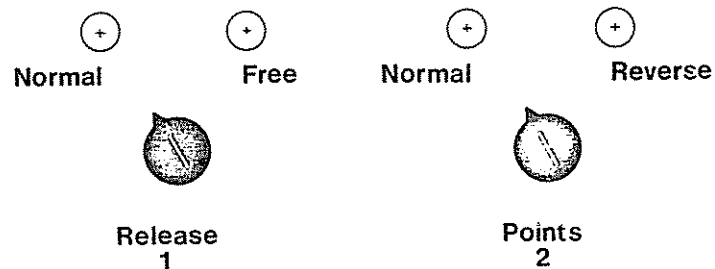
British Rail

Signal Engineering Department

EI-28 C7

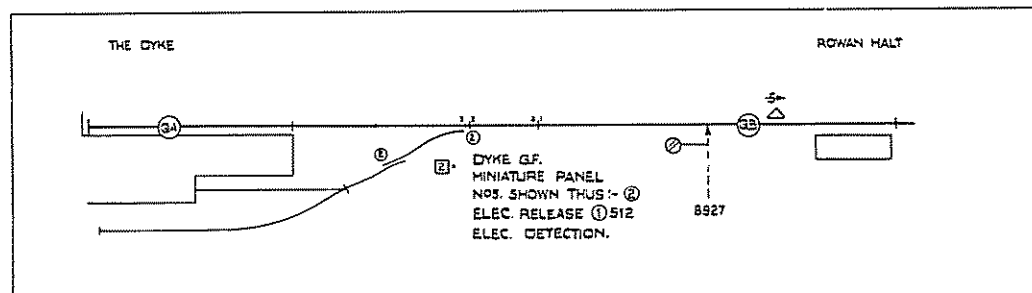
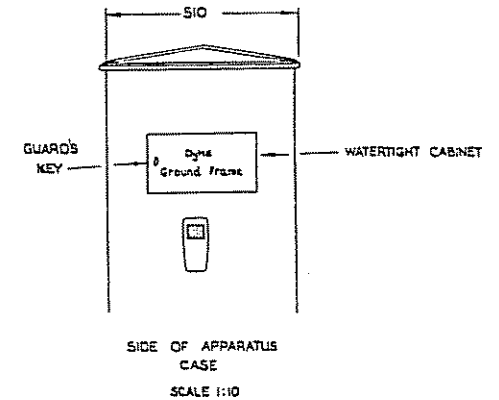
Dyke Ground Frame

Release from Dyke Junction : DJ512



SCALE 1:1

300



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TRACED BY

CHECKED BY

Southern Region
Chief Signal and Telecommunications Engineer

British Rail

Power Operated Ground Frame

Layout of Switch Cabinet

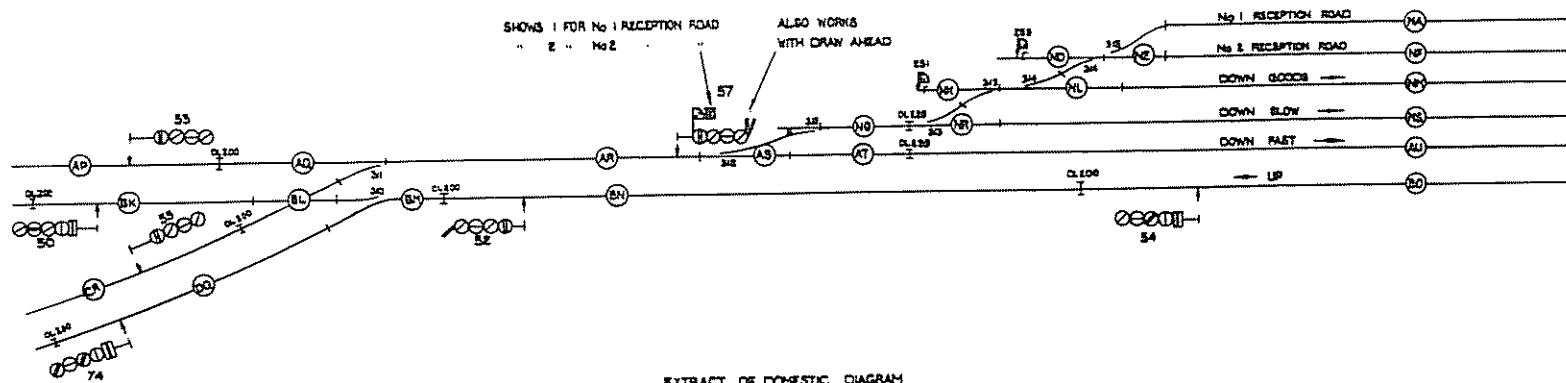
Chief Signal and
Telecommunications Engineer

EI-28 C8

APPENDIX D

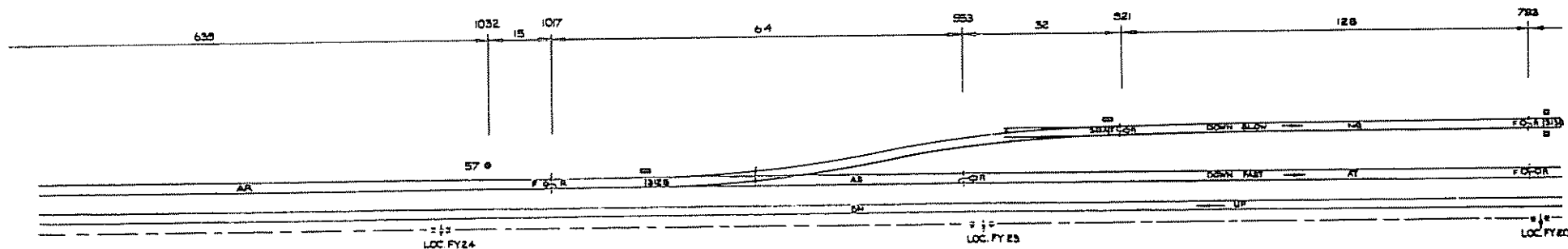
"TYPICAL" LOCATION

DRAWN BY:			Southern Region Chief Signal and Telecommunications Engineer	 British Rail Chief Signal and Telecommunications Engineer
TRACED BY:				
CHECKED BY:				
				No EI - 28 D



EXTRACT OF DOMESTIC DIAGRAM

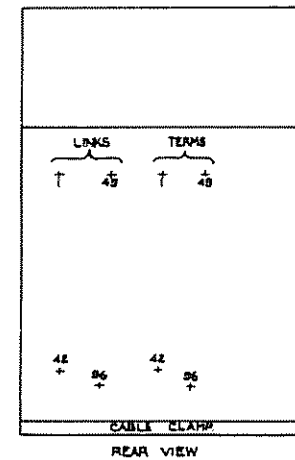
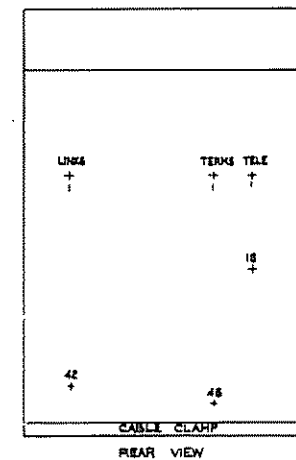
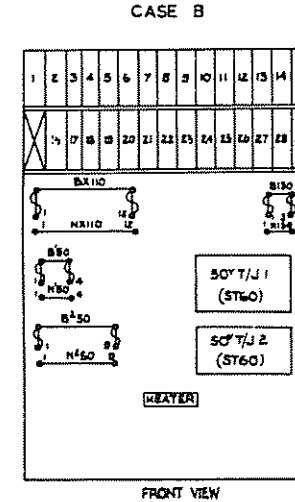
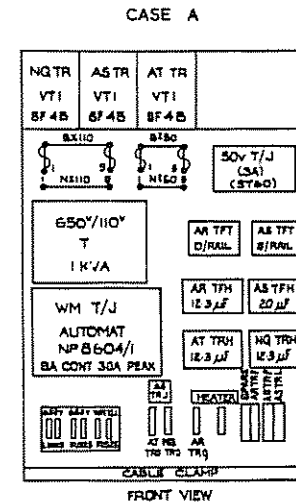
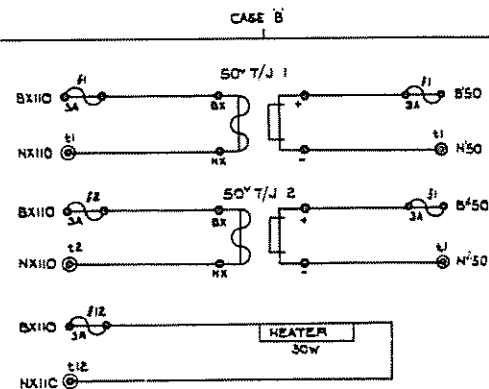
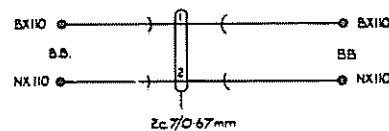
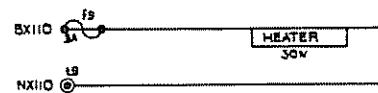
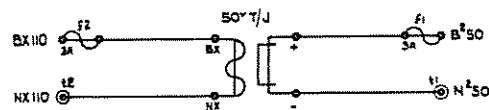
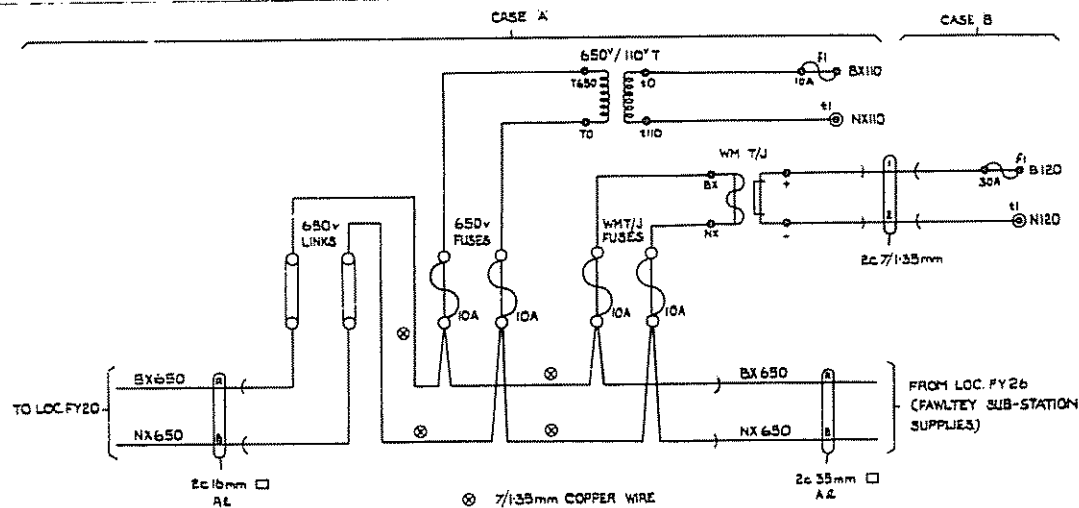
NB FOR THE PURPOSES OF THIS EXAMPLE SEPARATE OVERLAP TRACKS ON 52, 53, & 55 HAVE BEEN OMITTED AND TELEPHONES ETC. ARE NOT SHOWN ABOVE.



EXTRACT OF TRACK PLAN

NOTE: 1 A' END OF POINTS IS NEAREST TO RELAY ROOM
2 31E ARE SHOWN AS MOTOR POINTS.
31S ARE SHOWN AS CLAMPLOCK POINTS.

DRAWN BY	ISSUE 2	SPEED RESTRICTIONS REMOVED. NOTES ADDED.	Southern Region Chief Signal and Telecommunications Engineer	British Rail
TRACED BY				
CHECKED BY				
Diagram & Track Plan For Typical Location			Chief Signal and Telecommunications Engineer	
			No E1 - 28 D	



DRAWN BY CHECKED BY APPROVED BY	Southern Region Chief Signal and Telecommunication Engineer	British Rail Chief Signal and Telecommunication Engineer
SPECIMEN Fawley Location FY 24	SHEET 1 OF 11 SHEETS	O FY-EL 24-1

CASE A

BX110 FUSE	RATING	FUNCTION	SHEET	NX110 TERM
1	10A	SUPPLY	1	1
2	3A	50V T/J	1	2
3	3A	AR TF	8	3
4	5A	AS TF	8	4
5	3A	AS TQ	8	5
6	3A	AT TQ	8	6
7	3A	NQ TQ	8	7
8		SPARE		8
9	3A	CASE HEATER	1	9

B150 FUSE	RATING	FUNCTION	SHEET	N150 TERM
1	3A	SUPPLY	1	1
2	3A	AS T1PR	8	2
3	3A	AT T1PR	8	3
4	3A	NQ T1PR	8	4
5		SPARE		5

CASE B

BX110 FUSE	RATING	FUNCTION	SHEET	NX110 TERM
1	3A	50V T/J 1	1	1
2	3A	50V T/J 2	1	2
3	5A	57 UGE	5	3
4	5A	57 GE	5	4
5	5A	57 (B) UGE	5	5
6	5A	57 (S) GE	5	6
7	5A	57 AWS	5	7
8	3A	312A WH WEO	6	8
9	3A	312B WH WEO	7	8
10	3A	312 KR	7	10
11		SPARE		11
12	3A	CASE HEATER	1	12

B150 FUSE	RATING	FUNCTION	SHEET	N150 TERM
1	3A	SUPPLY	1	1
2	3A	57 SIGNAL RELAYS	4	2
3	3A	312 POINT RELAYS	6	3
4		SPARE		4

B150 FUSE	RATING	FUNCTION	SHEET	N150 TERM
1	3A	SUPPLY	1	1
2	3A	57 SCIPR	4	2
3	3A	57 PROVING	4	3
4	3A	53/55 HWR/DR	4	4
5	3A	312 WKR	6	5
6	3A	49 ALZR	9	6
7	3A	0Q T2PR	9	7
8	3A	AR T2PR	9	8
9		SPARE		9

B150 FUSE	RATING	FUNCTION	SHEET	N150 TERM
1	30A	SUPPLY	1	1
2	15A	312A WH	6	2
3	15A	312B WH	7	3

DRAWN BY

CHECKED BY

CHECKED BY

Southern Region
Chief Signal and Telecommunications Engineer
 British Rail

Specimen

Fawley

Location FY 24

Chief Signal and
Telecommunications Engineer

O FY-EL 24-2

BR 950 ETC. RELAYS

NR	RELAY TITLE	RELAY TYPE	PIN CODE	COILS								A								B								C								D							
				R1	R2	R3	R4	SHT	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8
1	57 UHR (1)	BR932 8F 68	O28								4	F-4	F-4	B-4				F-5	F-5	B-4	B-4																				B-4		
2	57 UHR (2)	BR932 8F 68	O28								4	F-4	F-4	B-4				F-5	F-5	B-4	B-4																			B-4			
3	57 UHR (G)	BR931 8F 68	O24								4	F-4	F-4	B-4							B-4	B-4																		B-4			
4	57 UHR (S1)	BR961 4F 4B 4F 4B	O17								4	F-4	F-5	B-4	B-4																									F-4	B-4	B-4	
5	57 UHR (S2)	BR961 4F 4B 4F 4B	O17								4	F-4	F-5	B-4	B-4																									F-4	B-4	B-4	
5	57 MR	BR961 4F 4B 4F 4B	O17								4	F-4	F-5	B-4	B-4																									F-4	B-4	B-4	
5	57 SR	BR961 4F 4B 4F 4B	O17								4	F-4	F-5	B-4	B-4																									F-4	B-4	B-4	
6	57 HR	BR930 8F 68	O04								4	F-4	F-4	B-4	B-4			F-4	F-4																					F-4	B-4	B-4	
7	57 HHR	BR931 8F 68	O24								4	F-4	F-4	B-4	B-4			F-4	F-4																					F-4	B-4	B-4	
8	57 CR	BR931 8F 68	O24								4	F-4	F-4	B-4	B-4			F-5	F-5																					F-4	B-4	B-4	
9	57 (S) HA	BR960 4F 4B 4F 4B	Z11								4	F-4	F-4	B-4	B-4			F-5	F-5																					F-4	B-4	B-4	
10	57 ECR	BR941 4F	O71								5	F-5	F-4																											F-5	F-4		
11	57 LECA	QMS 4F 2B	D89								5	F-4	F-4	B-4																													
12	57 WECA Q/J	QR1 18A	OEO								5																																
14	49 ALER	BR961 4F 4B 4F 4B	O17								9																														F-9	F-9	
15	50 TFR	BR933 8F 4B	O43								9	F-9	F-9																												F-9		
16	32 NWR	BR941 4F 4B 4F 4B	O17								6	F-6	F-6	B-6	B-6			F-6																							F-6	B-6	B-6
17	32 RWR	BR930 8F 4B	O03								6	F-6	F-6	B-6	B-6			F-6																							F-6	B-6	B-6
18	32 NWR	BR930 8F 4B	O03								6	F-6	F-6	B-6	B-6			F-6																							F-6	B-6	B-6
19	32 RWR	BR930 8F 4B	O03								6	F-6	F-6	B-6	B-6			F-6																							F-6	B-6	B-6
22	32A NWR	BR943 2XG4B	172								2			B-6	B-6																											B-6	B-6
23	32B NWR	BR943 2XG4B	172								2			B-6	B-6																											B-6	B-6
24	32A RWR	BR943 2XG4B	172								2			B-6	B-6																											B-6	B-6
25	32B RWR	BR943 2XG4B	172								2			B-6	B-6																											B-6	B-6

GXR! UNITS CODE 6015

[illegible]

RELAYS TO BR 849 CODE 6047

NO	RELAY TITLE	COIL			CONTACTS						
		R1	R3	SH	A1	B1	C3	A3	C3	A3	B7
20	3M2 WJR	1	1	6	/	/	B-6	/	/	/	/
					/	/		/	/	/	/
					/	/		/	/	/	/
					/	/		/	/	/	/

CRAWL # 1

TRAFFIC

CHECKED BY

ISSUE 2
VPR CONTACTS
ADDED

Southern Region
Chief Signal and Telecommunications Engineer

Specimen

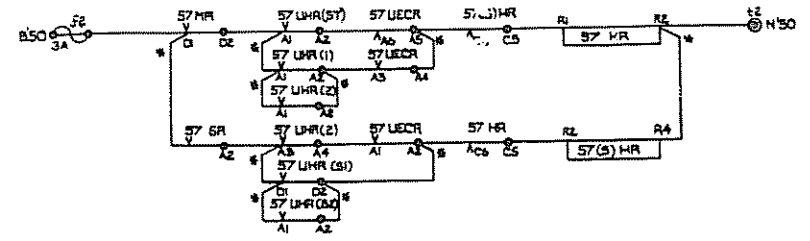
Fawcley

Location FY 24

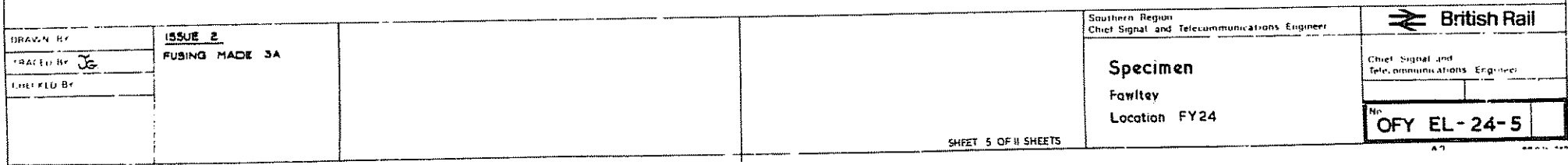
British Rail

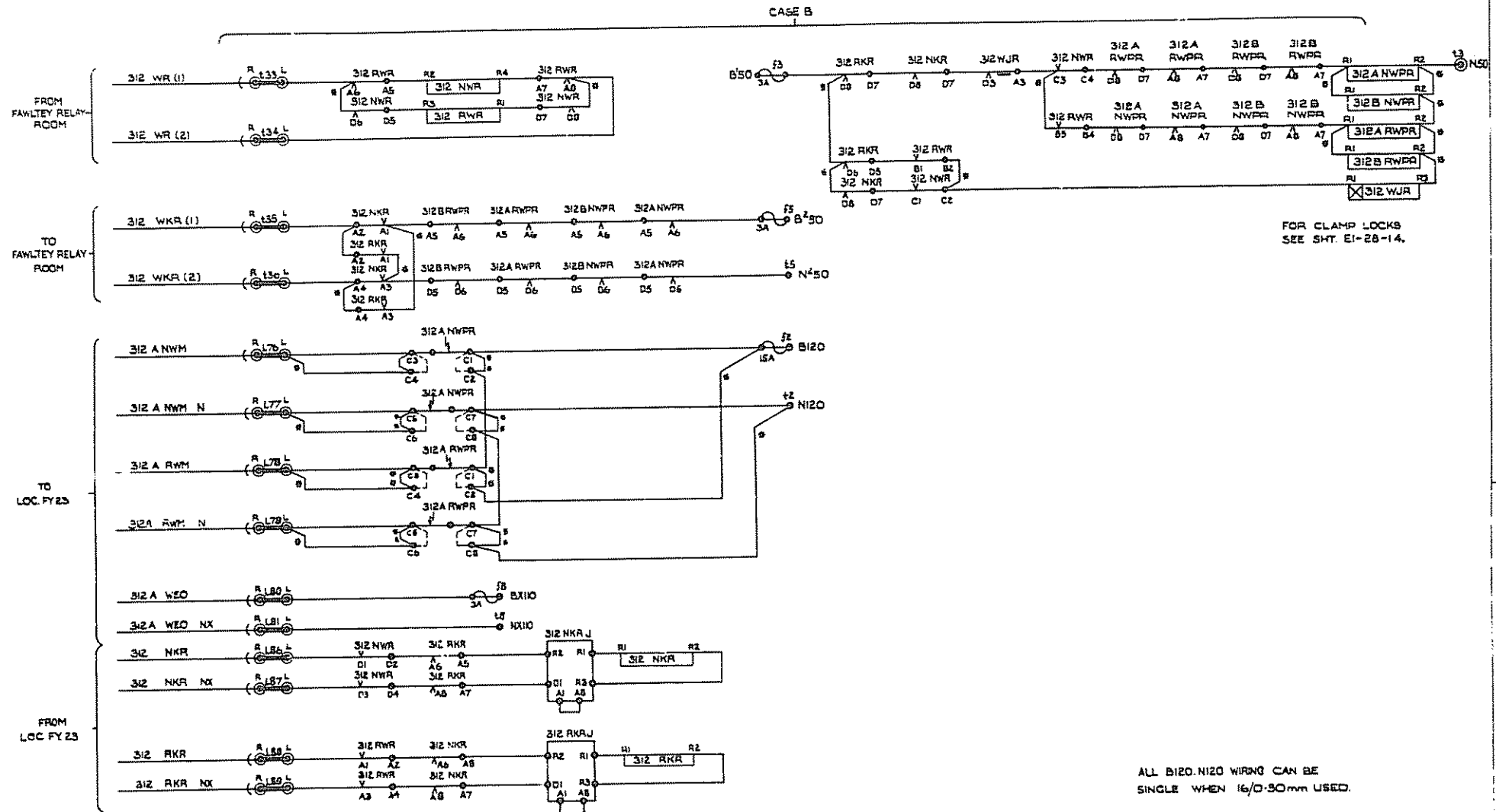
Chief Signal and
Telecommunications Engineer

0 FY-EL 24-3



NOTE: ALL 3 WIRE POLAR CIRCUITS
COULD BE 2 WIRE AS SHOWN
ON SHEET 21-28-23 IF VOLT DROP
LIMITATIONS ALLOW.





DRAWN BY
TRAFFIC BY JG
CHECKED BY

ISSUE 2
WPR CROSS PROVING
ADDED WKR MADE 2
WPR

Southern Region
Chief Signal and Telecommunications Engineer

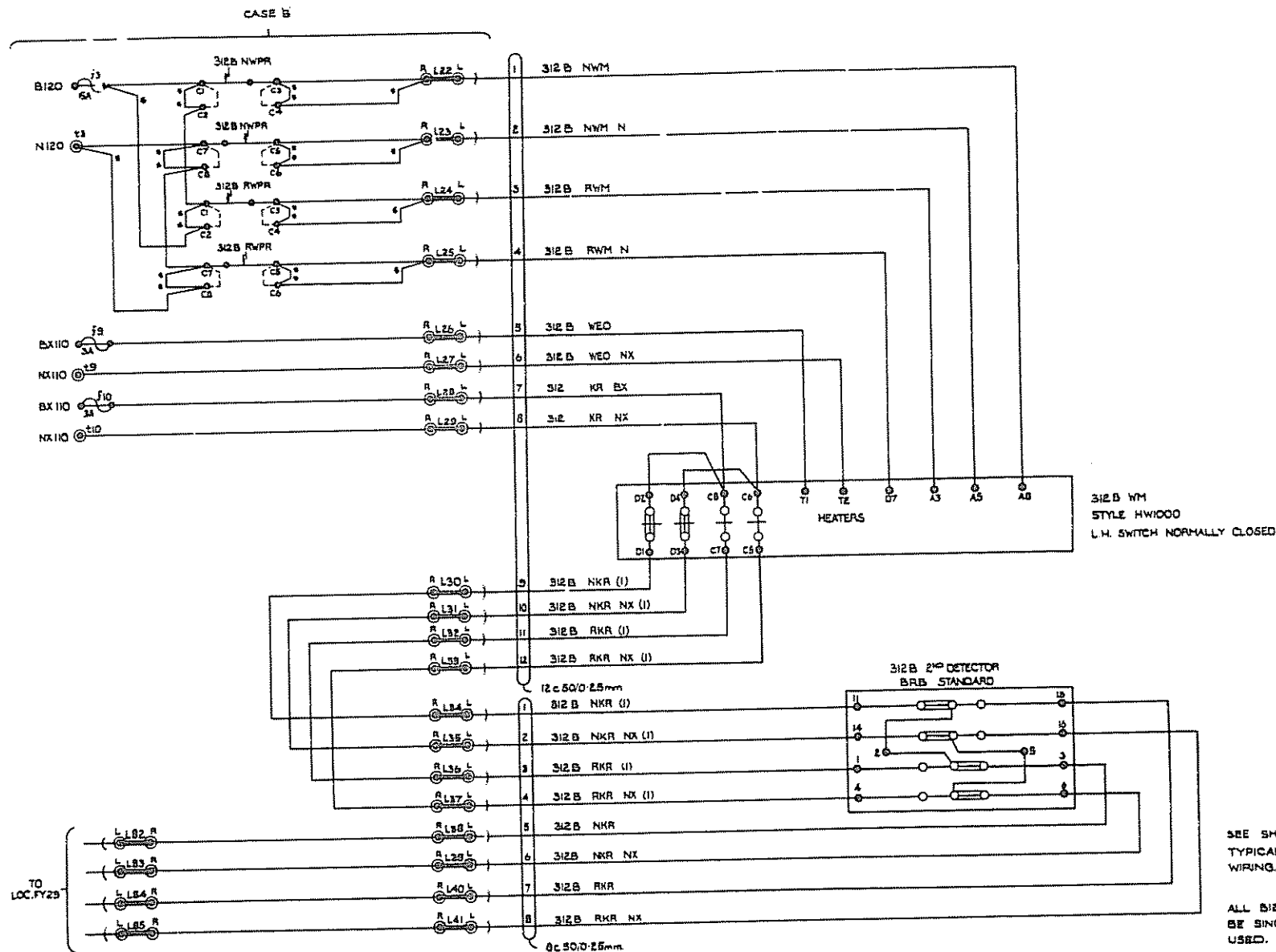
British Rail

Specimen

Faulting
Location FY 24

Chief Signal and
Telecommunications Engineer

No
O FY-EL 24-6



DRAWN BY

TRACED BY

CHECKED BY

Southern Region
Chief Signal and Telecommunications Engineer

Specimen

Fawley

Location FY 24

British Rail

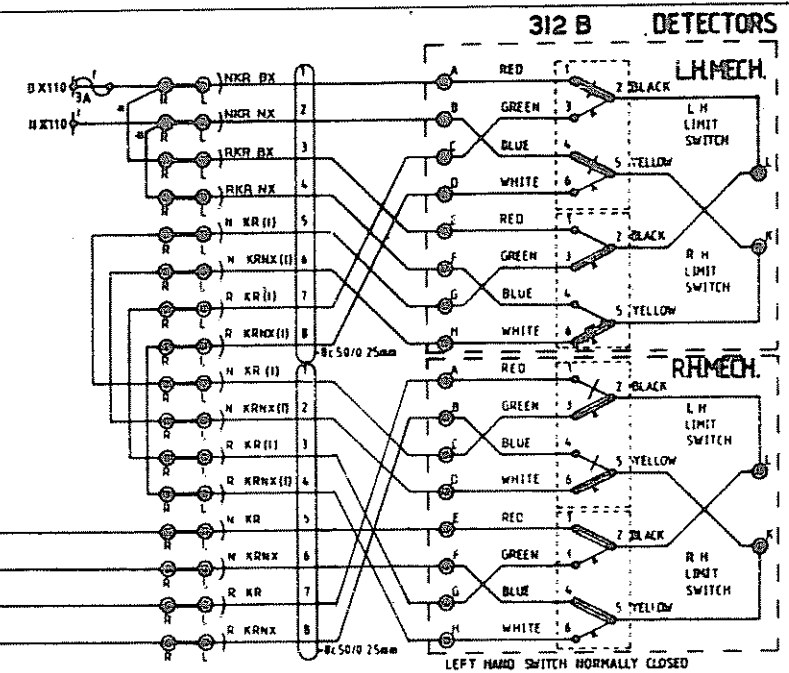
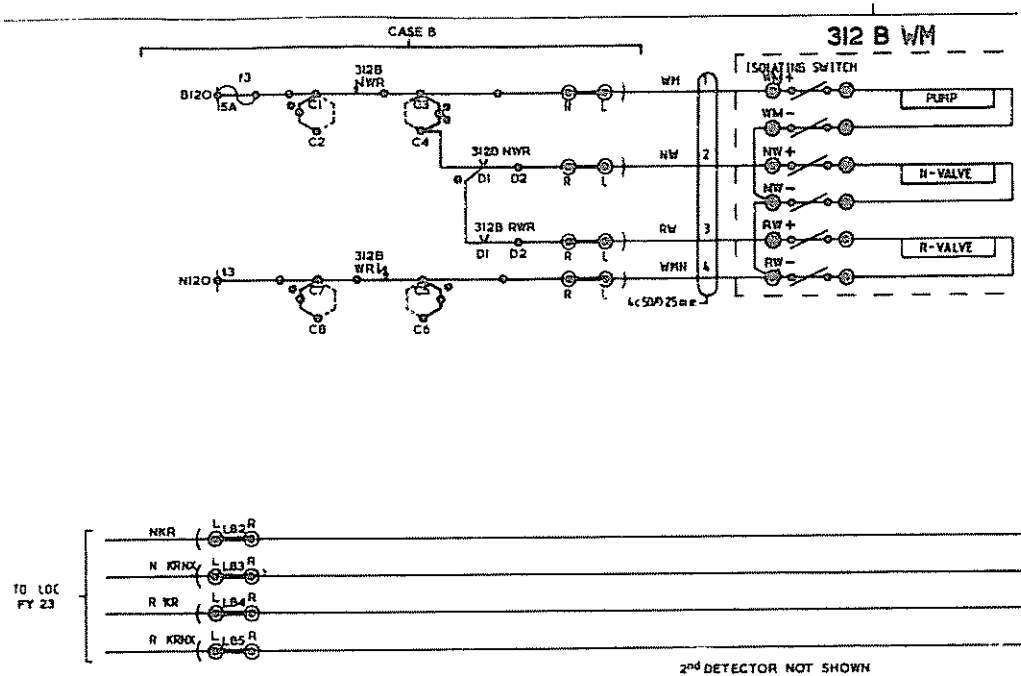
Chief Signal and
Telecommunications Engineer

O FY-EL 24-7

SHEET 7 OF 8 SHEETS

A2

BR 908 200

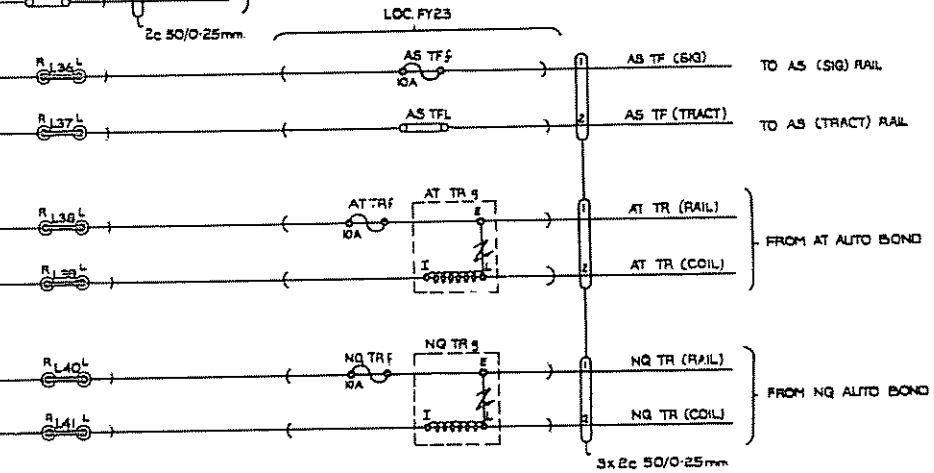
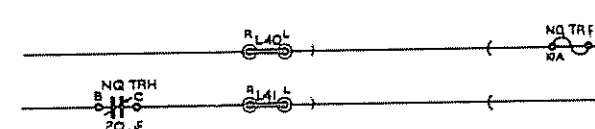
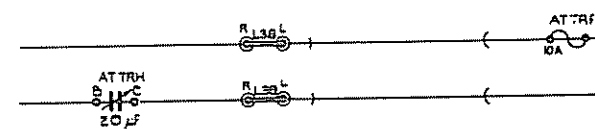
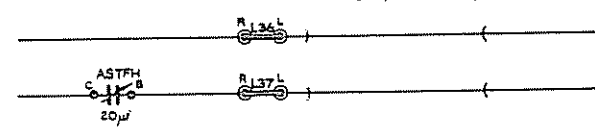
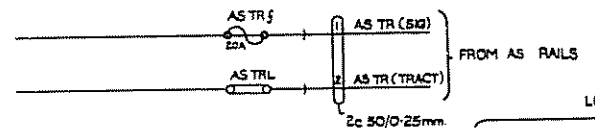
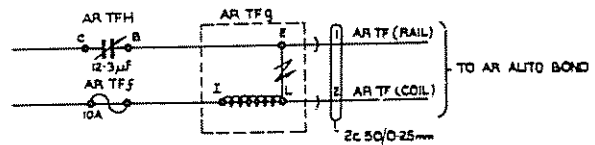
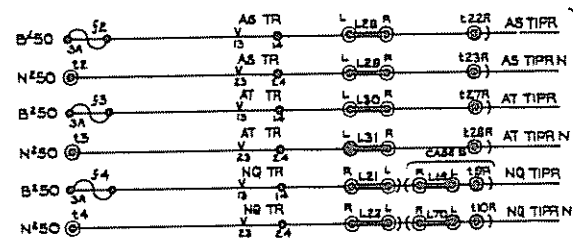
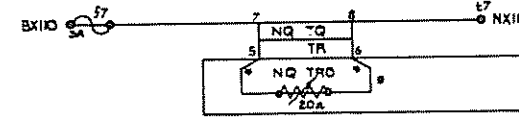
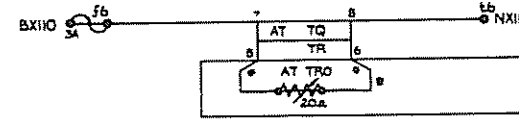
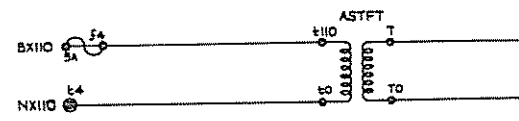
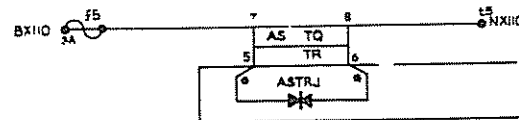
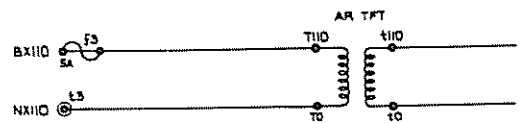


ALTERNATIVE WIRING WHEN CLAMPLOCKS USED

ALL LOCATION INTERNAL WIRINGS 9/0-30mm UNLESS OTHERWISE STATED
WIRES MARKED THUS 16/0-20mm

Drawn Checked Approved Traced Checked		Print issued	Contact made if points not fully normal Contact made if points not fully reverse	Southern Region Chief Signal and Telecommunications Engineer Specimen Fawitey Location FY24	British Rail Chief Signal and Telecommunications Engineer OFY-EL 24-7A
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CASE A



TO FAWLEY RELAY ROOM

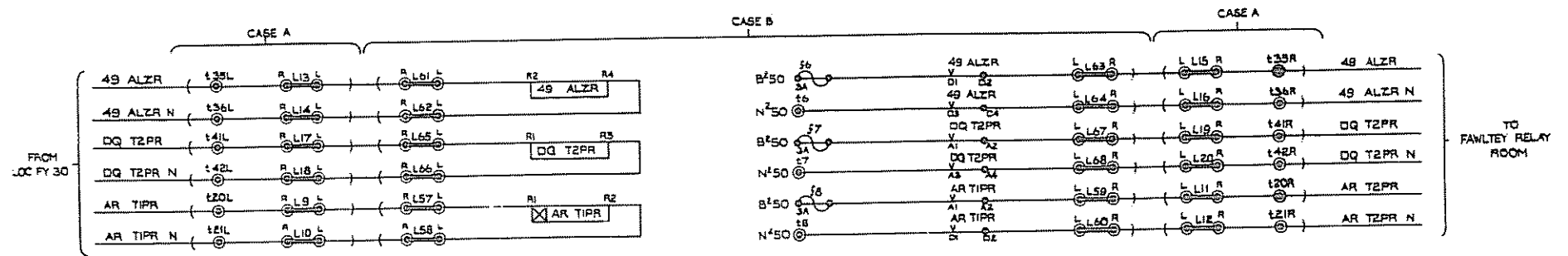
* NO RESISTOR REQUIRED WITH VT1 RELAY
FITTED WITH INTERNAL 2 μF CAPACITOR.

DRAWN BY	
TRACED BY	JG
CHECKED BY	

Southern Region
Chief Signal and Telecommunications Engineer

Specimen
Fawley
Location FY 24

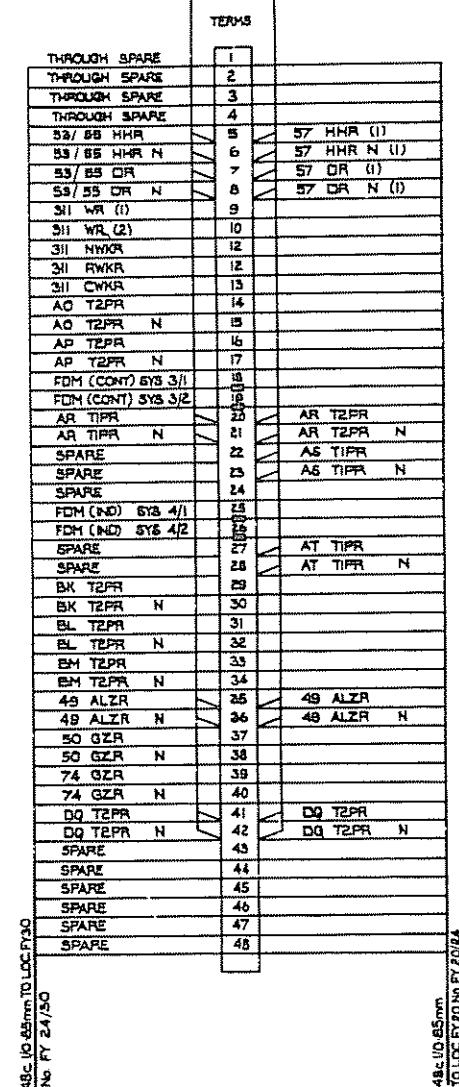
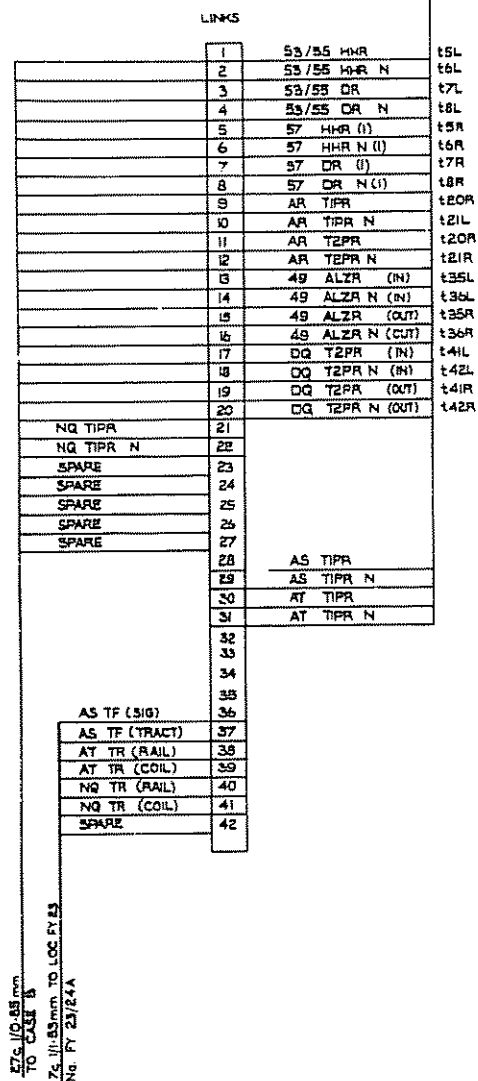
British Rail	
Chief Signal and Telecommunications Engineer	
No	O FY-EL 24-8



DRAWN BY	
TRAINED BY	
CHECKED BY	

Southern Region Chief Signal and Telecommunications Engineer
Specimen Fawley Location FY 24

British Rail
Chief Signal and Telecommunications Engineer
No O FY-EL 24-9



TELE

1

18

THROUGH CRIMP

CASE A

British Rail

Chief Signal and
Telecommunications Engineer

No
O FY-EL 24-10

A2

BR 906 740

DRAWN BY

THAWED BY JG

CHECKED BY

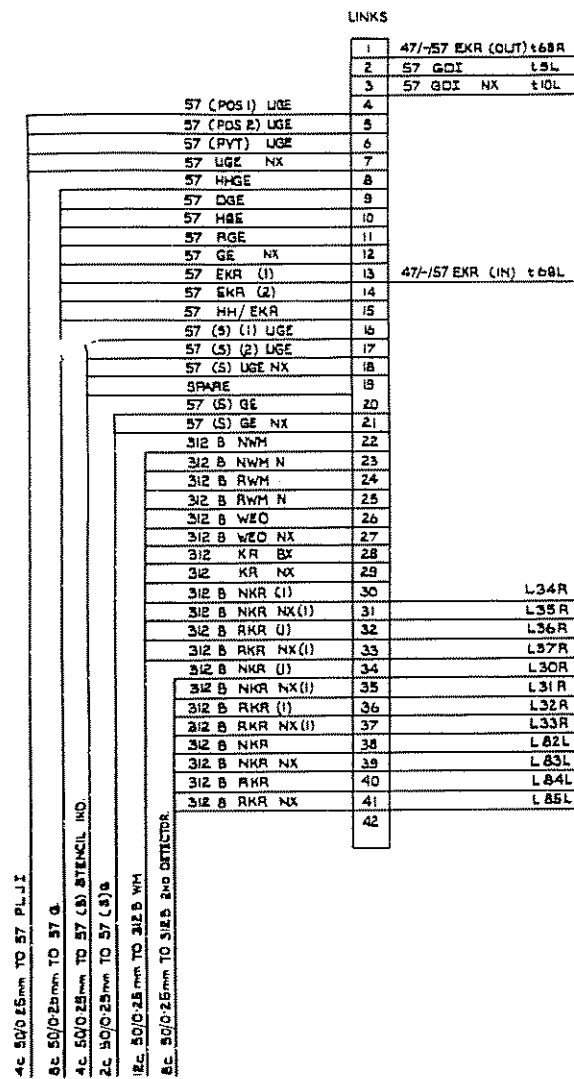
Southern Region
Chief Signal and Telecommunications Engineer

Specimen

Fawley

Location FY 24

SHEET 10 OF 11 SHEETS



LINKS	
1	47/-57 EKR (OUT) t68R
2	57 GDI t5L
3	57 GDI NX t10L
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	47/-57 EKR (IN) t68L
14	
15	
16	
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24	
25	
26	
27	
28	
29	
30	L34R
31	L35R
32	L36R
33	L37R
34	L38R
35	L31R
36	L32R
37	L33R
38	L82L
39	L83L
40	L84L
41	L85L
42	

LINKS	
49	53/55 HHR
50	53/55 HHR N
51	53/55 OR
52	53/55 OR N
53	57 HHR (1)
54	57 HHR N (1)
55	57 OR (1)
56	57 OR N (1)
57	AR T1PR
58	AR T1PR N
59	AR T2PR
60	AR T2PR N
61	49 ALZR (IN)
62	49 ALZR N (IN)
63	49 ALZR (OUT)
64	49 ALZR N (OUT)
65	DQ T2PR (IN)
66	DQ T2PR N (IN)
67	DQ T2PR (OUT)
68	DQ T2PR N (OUT)
69	NQ T1PR
70	NQ T1PR N
71	SPARE
72	SPARE
73	SPARE
74	SPARE
75	SPARE
76	312 A NWM
77	312 A NWM N
78	312 A RWM
79	312 A RWM N
80	312 A WED
81	312 A WED NX
82	312 B NKR
83	312 B NKR NX
84	312 B RKR
85	312 B RKR NX
86	312 NKR
87	312 NKR NX
88	312 RKR
89	312 RKR NX
90	SPARE
91	SPARE
92	SPARE
93	SPARE
94	SPARE
95	
96	

TERMS	
1	
2	
3	
4	
5	
6	
7	
8	
9	NQ T1PR
10	NQ T1PR N
11	57 UHR (1)
12	57 UHR (2)
13	57 UHR (3)
14	57 UHR (4)
15	57 UHR (5)
16	57 UHR (6)
17	57 UHR (7)
18	57 UHR (8)
19	57 M/SR (1)
20	57 M/SR (2)
21	57 M/SR (3)
22	57 HHR (2/3)
23	57 HHR N (2/3)
24	57 OR (2/3)
25	57 OR N (2/3)
26	57 ECIPR
27	57 ECIPR N
28	57 GIPR (1)
29	57 GIPR (2)
30	57 GIPR (3)
31	57 (SUB OFF) GPR
32	57 (SUB OFF) GPR N
33	312 WR (1)
34	312 WR (2)
35	312 WR (1)
36	312 WR (2)
37	SPARE
38	
39	
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41	
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TERMS	
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69	47/-57 EKR NX
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80	48/-54 EKR NX
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CASE B

DRAWN BY CHECKED BY DATE	Southern Region Chief Signal and Telecommunications Engineer Specimen Fawley Location FY24	 British Rail No. O FY-EL 24-11
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