UNITED KINGDOM MARITIME COASTAL COMMUNICATIONS SYSTEM (UKMACCS)

BACKGROUND

1 The SKYNET satellite system provides primary ship/shore/ship communication facilities for SCOT fitted ships, with access mainly through RAF OAKHANGER. The introduction of SCOT terminals does not remove the need for HF communications, which are required into the foreseeable future. To meet the Chiefs of Staff traffic handling times without major increases in manpower, it has become necessary to combine and automate the SCOT and HF Fleet services.

2 Coastal communications for years have been fragmented and have had a lot of shortcomings, but have now been modernised and centralised to provide better facilities and to improve access for traffic to and from the NSTN.

REQUIREMENTS

3 The requirements stated above have been met by dividing Fleet communications into two categories, providing the systems necessary to meet the requirements of each.

Ships Beyond 200 nm of UK

4 (1) The terminal position shall be at one central point.

(2) Having achieved access to the ship/shore/ship system a ship must be able to pass traffic into the termination using one of three possible key lists (UK, AUSCANUKUS, NATO) and the terminal must be able to automatically accept such a message.

(3) Messages of all categories which do not require editing must be provided with fast transfer to the shore network to obtain full benefit from the NSTN.

(4) Messages which do require editing must be diverted to the supervisors position for attention.

Ship Within 200 nm of UK

5 The communications requirements are met in the main by the United Kingdom Maritime Coastal Communications System (UKMACCS), which is based on the "North/South Concept", with remote transmitters, receivers and associated aerials colocated with NATO and RAF communications facilities at the following sites:

Area	Tx Site	Rx Site
Northern (NE Scotland)	RAF MILLTOWN	RAF KINLOSS
Southern (SW England)	RAF ST EVAL	PENHALE SANDS

6 UKMACCS provides space diversity for reliable skywave propagation, duplicate facilities and reduced vulnerability. The Tx and Rx stations are remotely controlled from a central terminal at Commcen Whitehall, with a standby terminal at HMS FOREST MOOR.

7 HF facilities at PORTLAND and FASLANE, enhanced under NSR 7314, provide for the special communications requirements at these sites.

8 Within 50 miles of the UK Naval Ports of PLYMOUTH, PORTSMOUTH and ROSYTH, communications are provided using improved UHF facilities.

SYSTEMS

Beyond 200 nm

9 Concentration of Fleet communications beyond 200 nm is provided and automated by the Message Processor (MEP) Outfit PRA(1), Management Processor (MAP) Outfit PRB(1) and the Cryptographic Switching Unit (CSU) Outfit PRC(1).

10 Tasks allocated to the system are:

(1) Administration of channel availability broadcasts for HF ship/shore subscribers, and channel receipt information for satellite ship/shore subscribers.

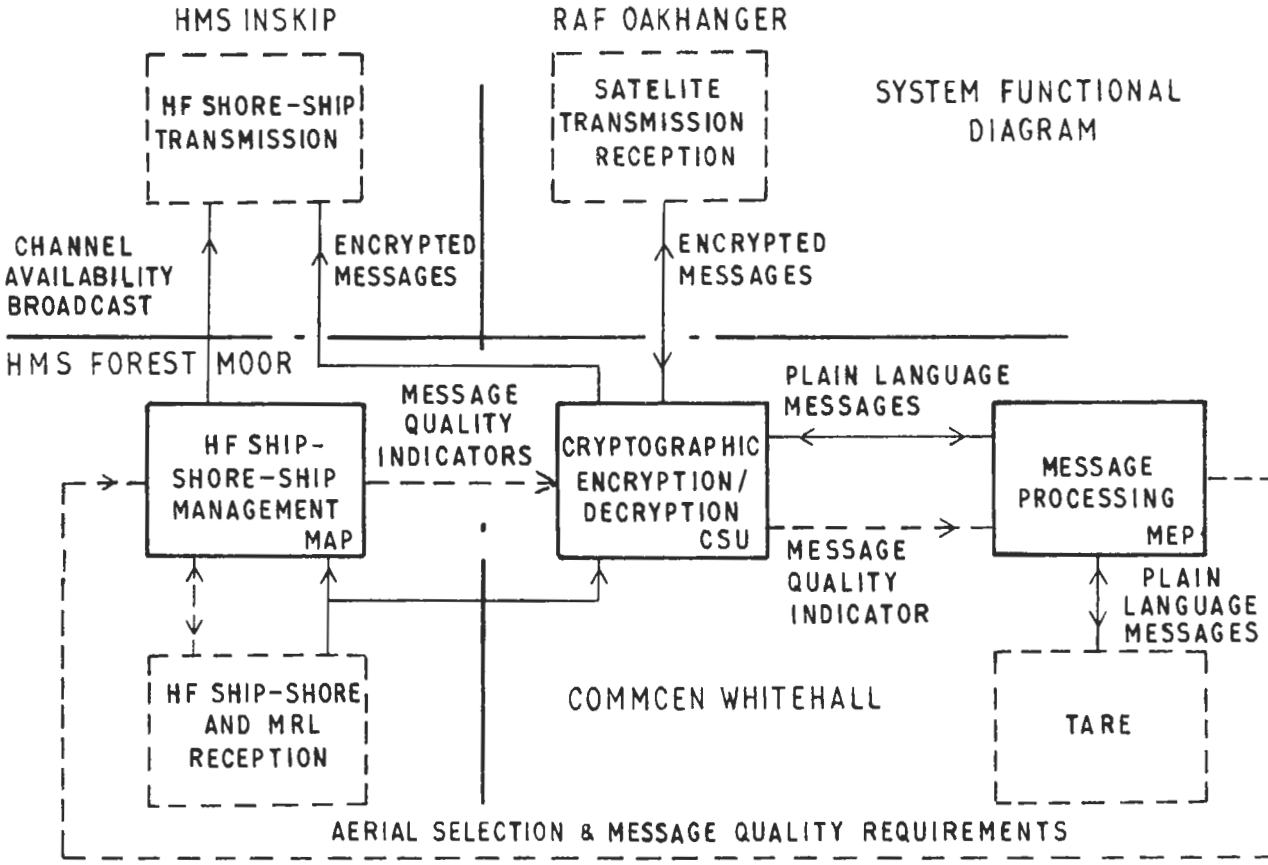
(2) Message handling for Broadcast channels.

(3) Reception and choice of decryption of messages in different key lists on HF ship/shore and satellite ship/shore channels.

(4) Reception of decrypted messages and transmission of messages on HF and satellite Maritime Rear Links.

(5) Transmission of plain languages messages, in priority structured sequences to the TARE and other channels.

11 The channel availability broadcast and HF ship/shore reception tasks are provided by the MAP at HMS FOREST MOOR. The decryption task for HF ship/shore messages is provided by the CSU and associated cryptographic equipment at WHITEHALL COMMCEN. The plain language message distribution task and message broadcast tasks are handled by the MEP, also at WHITEHALL. Message encryption tasks and decryption tasks (other than those for HF ship/shore) are handled by direct connections to cryptographic equipment in WHITEHALL COMMCEN.



12 Communication channels provided by the system are as follows:

HF Ship/Shore	10 Channels
HF MRL	5
HF Broadcast	5
Satellite Ship/Shore	14 Channels
Satellite Broadcast	4
Satellite Receipt	1
Satellite MRL	4
NSTN - MEP	2
MEP - NSTN	2

Within 200 nm

13 The System may be used by all RN ships within 200 nm of UK for skywave communication to two Coastal System Control Centres (CSCs), with access to those CSCs by Fleet HQs at Northwood, Pitreavie and Plymouth, and by the Strike

Command Integrated Communications System (STCICS). It is an HF system operating in the range 3-30 MHz and comprises a Southern group with transmitter and receiver sites at St Eval and Penhale Sands respectively, and the Northern counterparts at Milltown and Kinloss. These sites are remotely controlled from one of two CSCs, the primary one being at WHITEHALL and the secondary one at HMS FOREST MOOR. Only one CSC can be in control at any one time. Milltown, Kinloss and St Eval are colocated with RAF facilities and are RAF manned, whilst Penhale Sands is RN maintained.

14 The Coastal system is designed to provide the following facilities:

(1) A secure speech connection to Northwood/Pitreavie/Plymouth.

(2) A plain speech connection to Northwood/Pitreavie/Plymouth.

(3) RATT ship/shore.

(4) A plain speech circuit for non RATT fitted minor war vessels.

(5) An on-line MRL.

(6) A radphone connection into the Naval Operational network via Northwood exchange.

(7) A radphone connection via the local Command Telephone Exchange.

(8) A secure or plain voice connection into STCICS.

(9) A cw capability on a standby basis.

Composition of a CSC

15 The CSC comprises one supervisor's bay with two supervisor positions; four operator bays (voice) and (morse), each handling three radio circuits; one radio telephone bay to handle two circuits and two operator bays (RATT). Associated with the supervisor bay are two VDUs which are used for Command input to the remote control system.

Receiving Site Requirements

16 Each receiving site has a similar equipment fit and can be controlled from either CSC. Major items of equipment are:

(1) Directional antenna system (Plessey PVS 1120A system giving 24 directional outputs).

(2) High angle monopole.

(3) Low angle monopoles.

(4) 10 receivers - Plessey Type CHM-1.

(5) Antenna Exchange Outfit - A 30-input, 16-output rf switching matrix.

(6) Matrix Controller - This connects the switching matrix to the remote control system and also provides the sampling of receiver outputs required for the aerial display generation.

(7) Station Services Controller - This provides monitoring and control of such station services as standby power supplies and fire systems.

Transmitting Site Requirements

17 Each transmitter site has the same equipment fit and can be controlled from either CSC. Major items of equipment are:

(1) 1 Power Bank - 6 + 2 wideband amplifiers and a dummy load.

(2) 10 Drive Unit - Marconi H1541.

(3) 2 High Angle Antenna.

(4) 1 Low Angle Antenna.

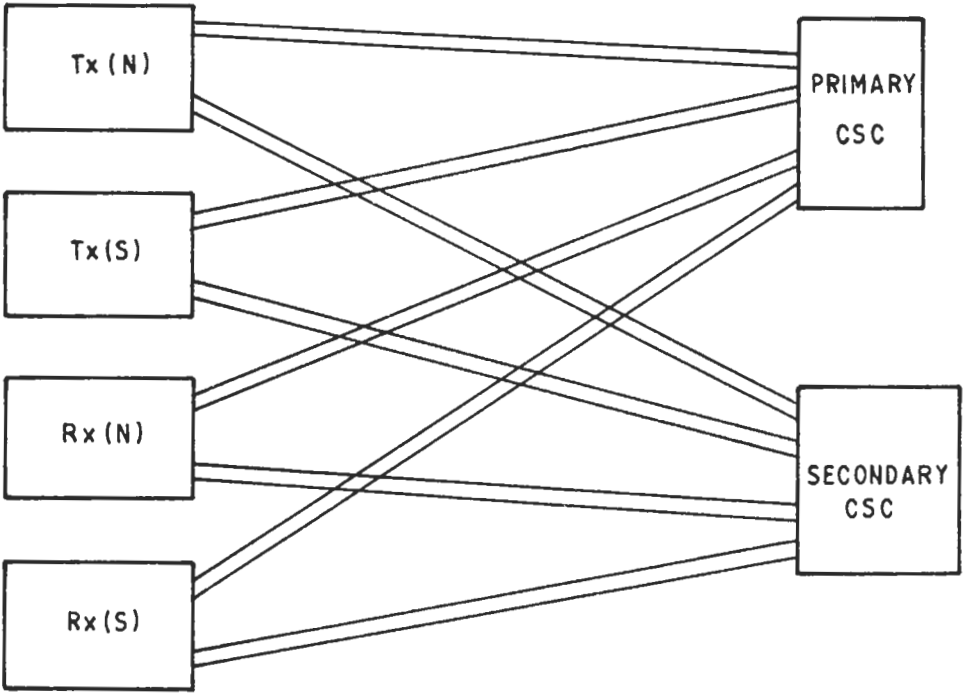
(5) 1 Auto Tune Amplifier - Marconi H1140 UK FRT 645.

(6) Antenna Exchange Controller - This connects the antenna exchange to the remote control system.

(7) Station Service Controller - as 16(7).

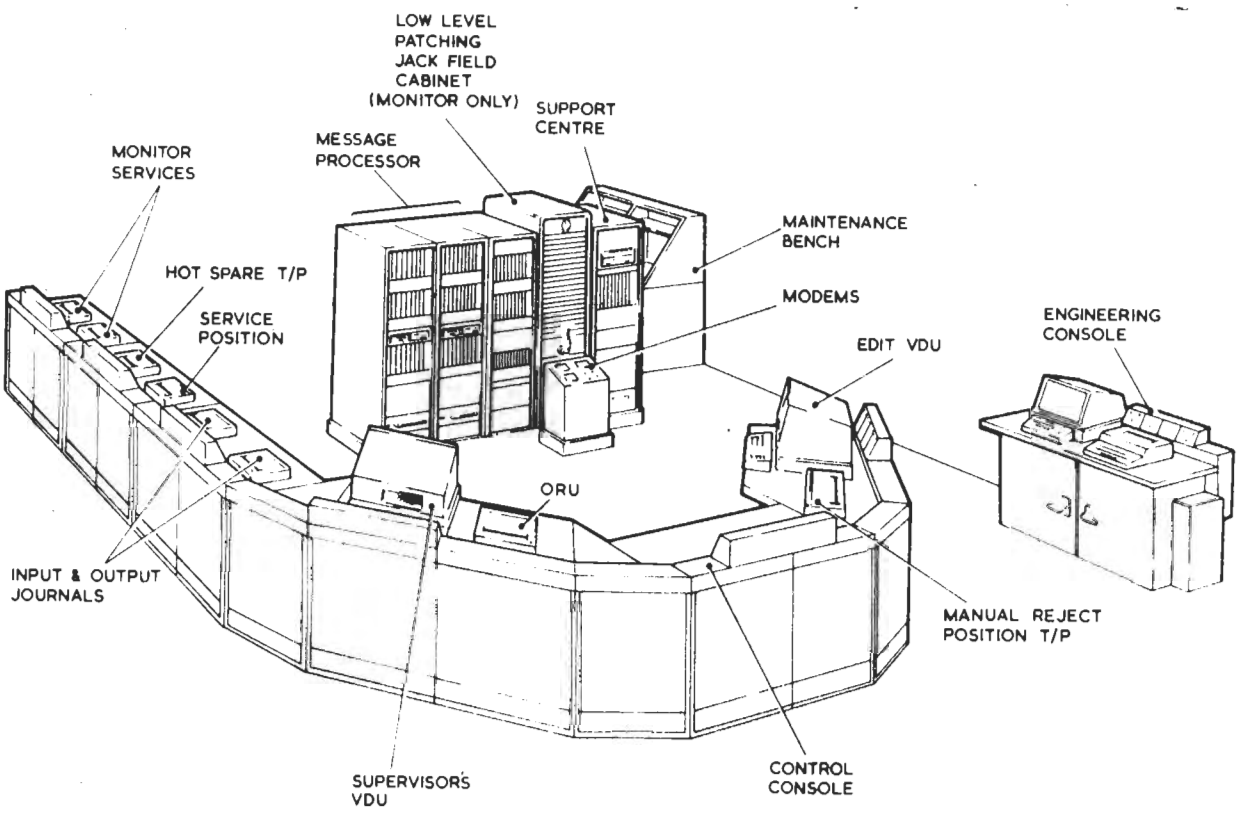
Inter-Station Links

18 Transmitter and Receiver stations are connected to each CSC by BT audio landline. Alternative routeing is employed to enable half the circuits between stations to be routed separately over the whole route, providing primary and secondary keying and control routeing.

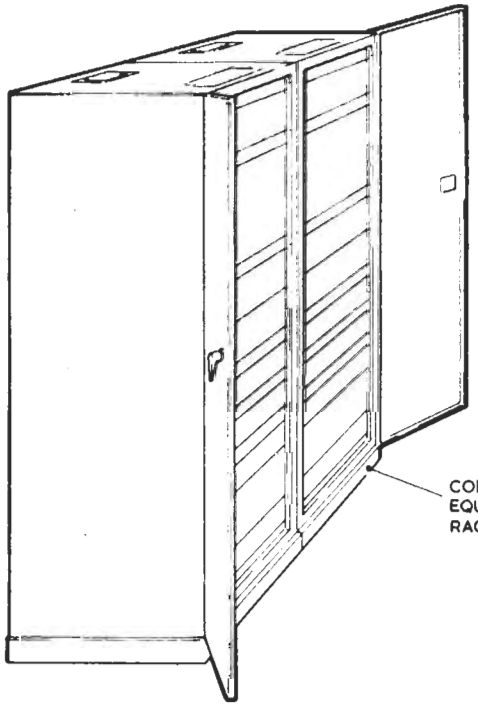


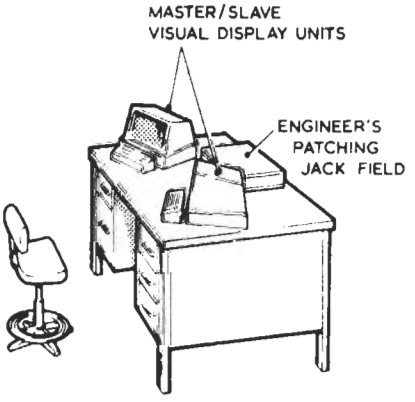
EACH TRUNK CONSISTS OF 12 AUDIO LINES
DIVERSELY ROUTED INTO TWO GROUPS.

STATION CONNECTIONS.

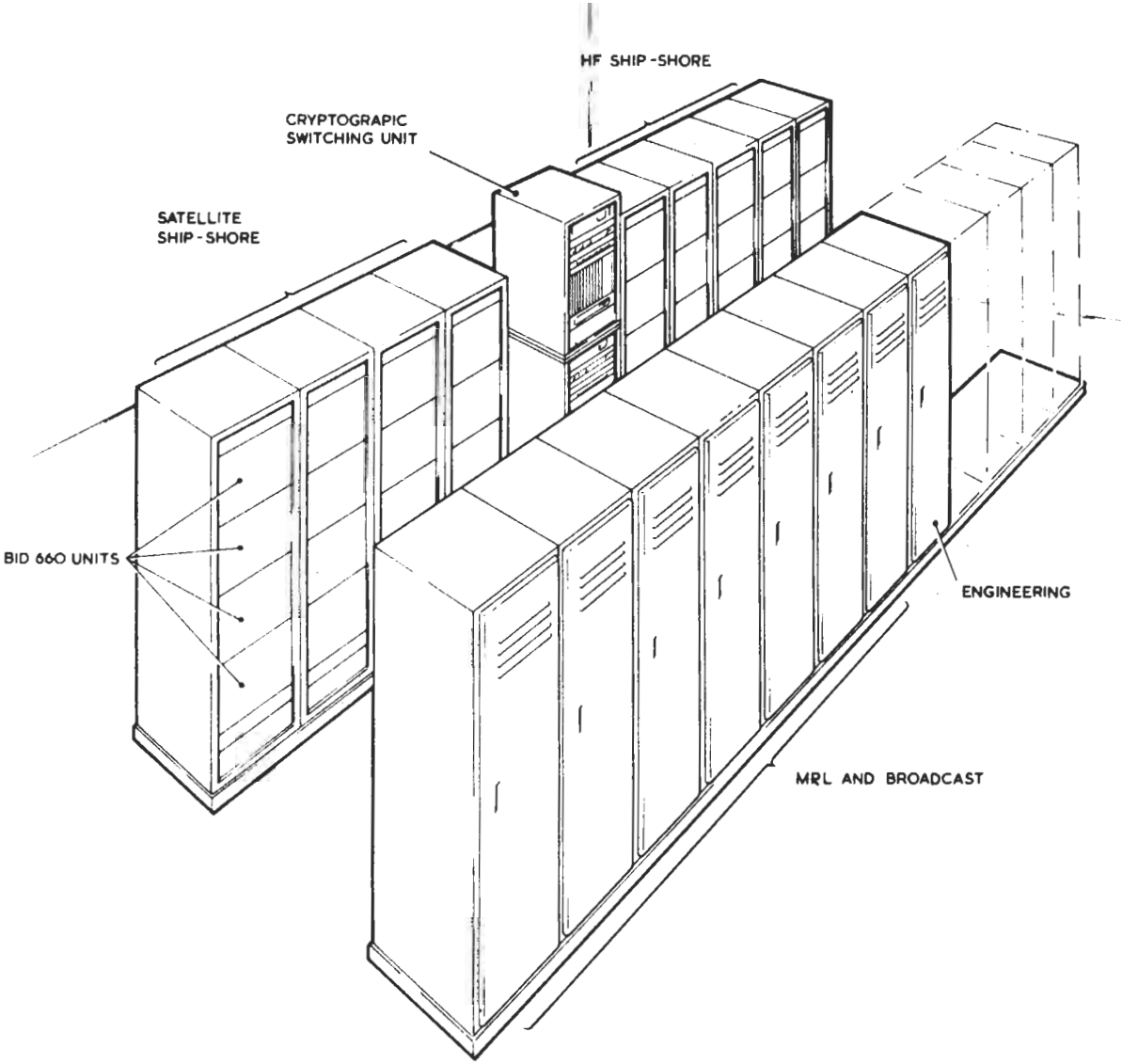


Message Processor Equipment Layout





Management Processor Equipment



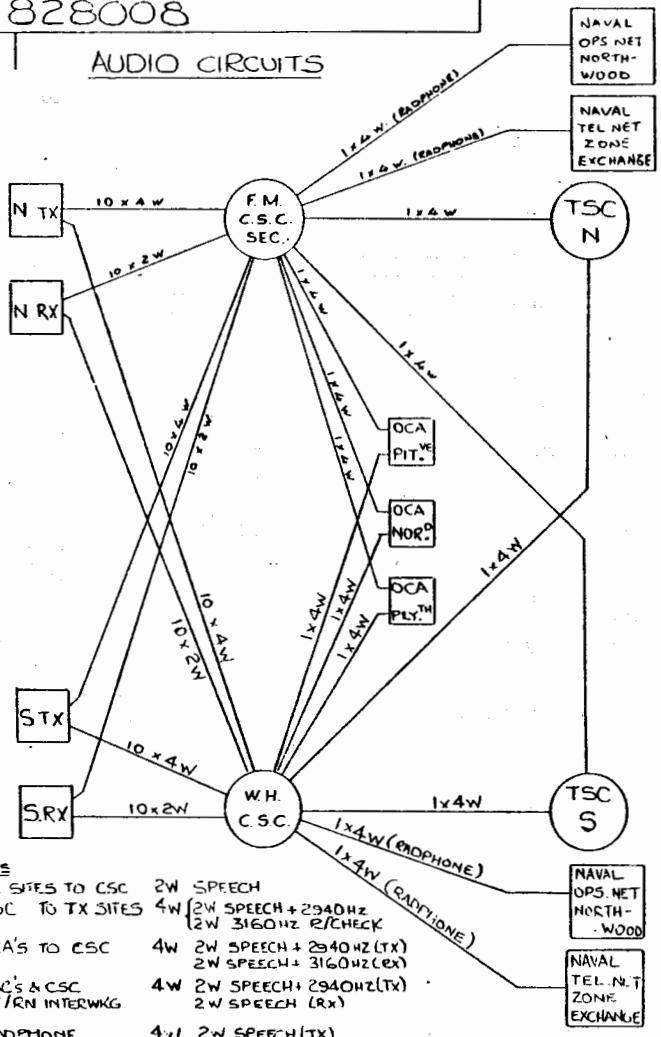
Cryptographic Equipment Layout

SECURITY CLASSIFICATION
RESTRICTED

SERVICE DRAWING NUMBER / SHEET NUMBER
828008

USED ON

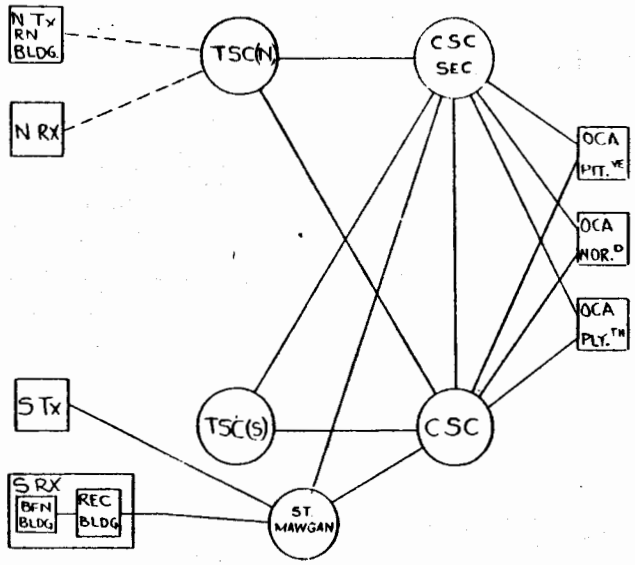
AUDIO CIRCUITS



NOTES

1 RX SITES TO CSC 2W SPEECH
2 CSC TO TX SITES 4W (2W SPEECH + 2940Hz, 2W 3160Hz R/CHECK
3 OCA'S TO CSC 4W 2W SPEECH + 2940Hz (TX), 2W SPEECH + 3160Hz (RX)
4 TSC'S & CSC RAF/RN INTERWKG 4W 2W SPEECH + 2940Hz (TX), 2W SPEECH (RX)
5 RADPHONE (2 RADIO CRCTS) 4W 2W SPEECH (TX), 2W SPEECH (RX)
6. ALL LINES WILL BE TERMINATED AT PJF EXCEPT RADPHONE 4W LINES WHICH WILL BE ROUTED DIRECT TO RADPHONE TERMINAL
7 SPEECH LINES BETWEEN CSC'S & RADIO SITES, CSC'S & OCA'S & CSC'S & TSC'S ARE SCHEDULE D

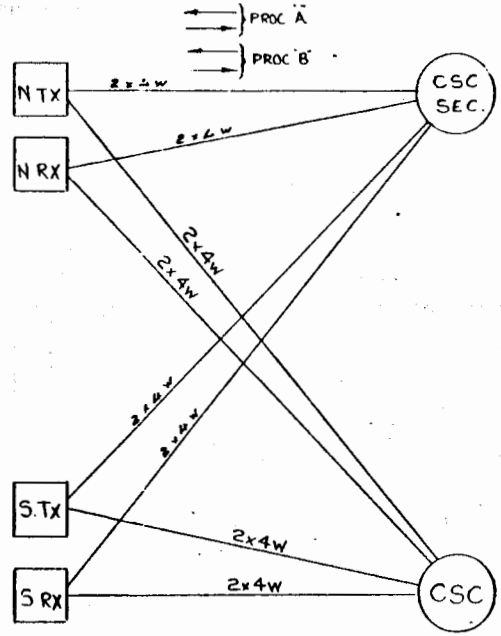
ORDER WIRES



NOTES

1. ALL LINES BETWEEN CSC'S & OCA'S & CSC & TSC'S ARE SCHEDULE D
2 DOTTED LINES ARE PART OF RAF NETWORK
3 ORDER WIRES BETWEEN CSC AND TSC'S ARE TERMINATED IN PMBX'S AS EXTENSIONS
4 ORDER WIRE ACCESS TO RN RECEIVER & TRANSMITTER AREAS AT RAF SITES & RECEIVER BUILDING AT PENHALE SANDS WILL BE SUPPLEMENTED BY PHONE ACCESS TO CONTROL MODEMS

REMOTE CONTROL



NOTES

1 ALL LINES ARE SCHEDULE D
2 LINES TERMINATED AT PJF'S ON EACH SITE
3 PROVISION TO BE MADE FOR PHONE ACCESS INTO CONTROL MODEMS TO SUPPLEMENT ORDER WIRE NETWORK
4 REMOTE CONTROL DATA RATE 2·4 K BITS/SEC 8 BIT CHARACTERS.

24

CERTS					
CHECKED					
DRAWN A. KEMMISH 13B					

CHANGE	ISSUE	DATE
AUDIO CIRCUITS NOW 10 in No.	5	23.6.83
CSC. SEC REDRAWN	4	2.7.82
CSC SEC. DELETED	3	18.11.81
REMOTE CONTROL - 2 x 4 W LINK REMOVED BETWEEN CSC'S	2	18.8.80
ORIGINAL DRAWING	1	1.4.80

CONTRACTOR

M O D (N)

TITLE NSR 7345
RN LINE REQUIREMENTS FOR AUDIO, ORDER WIRE & REMOTE CONTROL NETWORKS

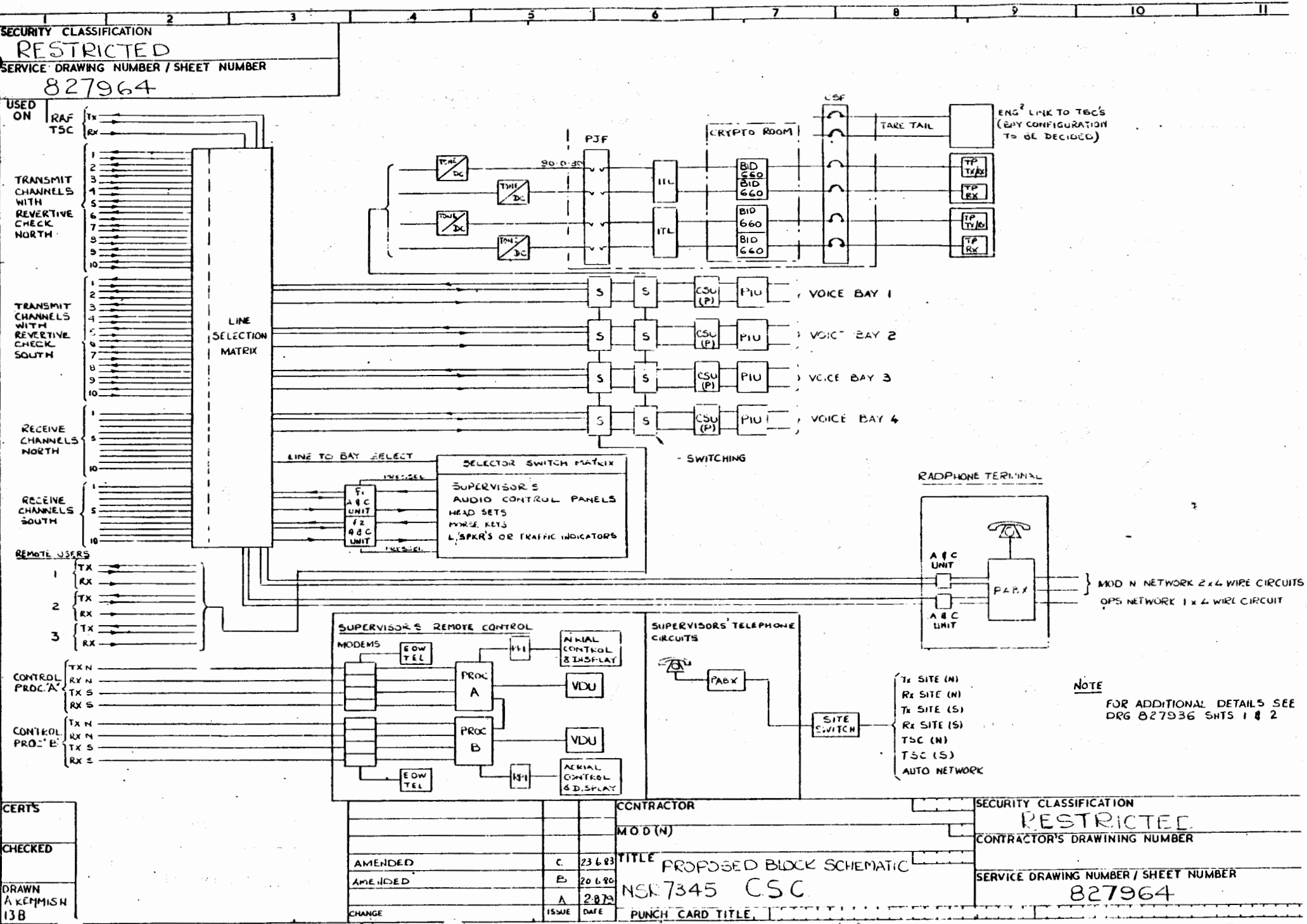
PUNCH CARD TITLE.

SECURITY CLASSIFICATION
RESTRICTED

CONTRACTOR'S DRAWINING NUMBER

SERVICE DRAWING NUMBER / SHEET NUMBER
828008

SECURITY CLASSIFICATION
RESTRICTED
SERVICE DRAWING NUMBER / SHEET NUMBER
827964



NOTE
FOR ADDITIONAL DETAILS SEE DRG 827936 SHTS 1 & 2

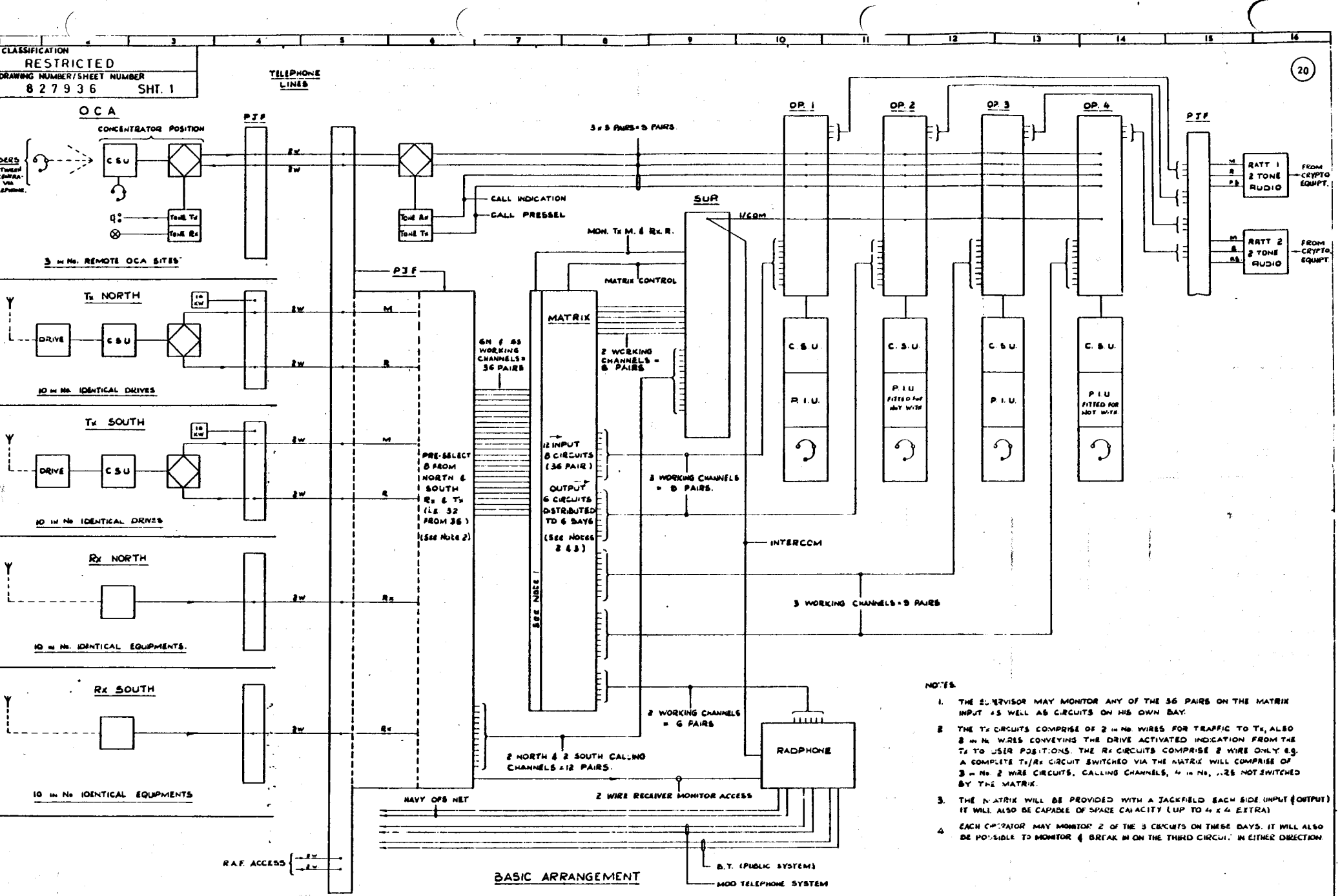
CERTS			
CHECKED			
DRAWN A KEMMISH 13B			
AMENDED	C	23 6 83	
AMENDED	B	20 6 80	
CHANGE	A	2 8 79	
	ISSUE	DATE	

CONTRACTOR
MOD (N)
TITLE PROPOSED BLOCK SCHEMATIC
NSN 7345 CSC
PUNCH CARD TITLE

SECURITY CLASSIFICATION
RESTRICTED
CONTRACTOR'S DRAWING NUMBER
SERVICE DRAWING NUMBER / SHEET NUMBER
827964

CLASSIFICATION
RESTRICTED
DRAWING NUMBER/SHEET NUMBER
8 2 7 9 3 6 SHT. 1

20



BASIC ARRANGEMENT

NOTES.

1. THE SUPERVISOR MAY MONITOR ANY OF THE 36 PAIRS ON THE MATRIX INPUT AS WELL AS CIRCUITS ON HIS OWN BAY.
2. THE Tx CIRCUITS COMPRISE OF 2 in No. WIRES FOR TRAFFIC TO Tx, ALSO 8 in No. WIRES CONVEYING THE DRIVE ACTIVATED INDICATION FROM THE Tx TO USER POSITIONS. THE Rx CIRCUITS COMPRISE 2 WIRE ONLY E.G. A COMPLETE Tx/Rx CIRCUIT SWITCHED VIA THE MATRIX WILL COMPRISE OF 3 in No. 2 WIRE CIRCUITS. CALLING CHANNELS, 4 in No, ARE NOT SWITCHED BY THE MATRIX.
3. THE MATRIX WILL BE PROVIDED WITH A JACKFIELD EACH SIDE (INPUT & OUTPUT) IT WILL ALSO BE CAPABLE OF SPARE CAPACITY (UP TO 4 x 4 EXTRA)
4. EACH OPERATOR MAY MONITOR 2 OF THE 3 CIRCUITS ON THESE BAYS. IT WILL ALSO BE POSSIBLE TO MONITOR & BREAK IN ON THE THIRD CIRCUIT IN EITHER DIRECTION.

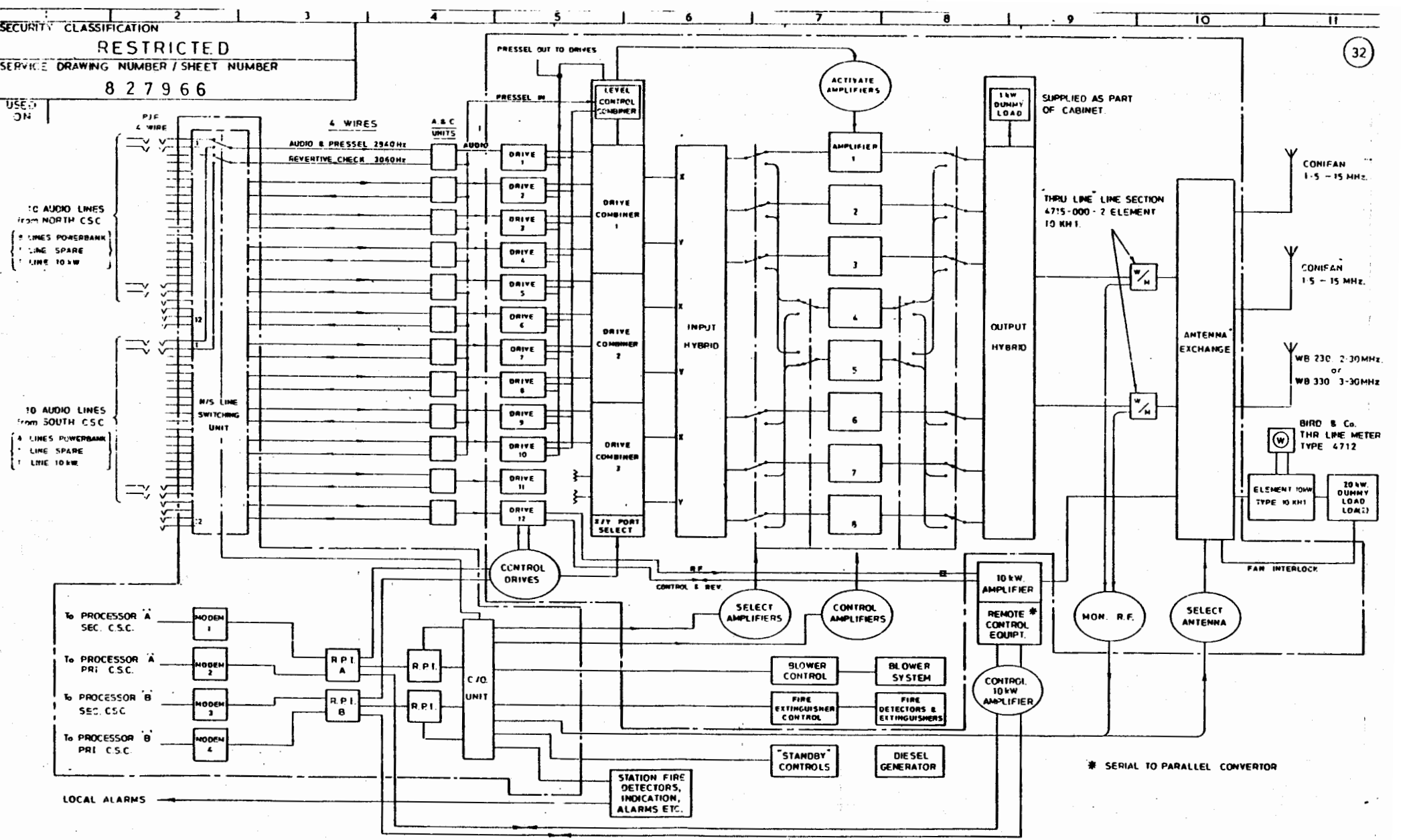
AMENDED	10	21 10 83
NON 8w LINE DELETED	09	23 6 83
B.T. (PUBLIC SYSTEM) LINES ADDED	08	23 2 82
AMENDED	07	11 2 81
AMENDED	06	2 2 81
[illegible]	05	[illegible]
REDRAWN	04	15 1 80
CHANGE	ISSUE	DATE

CONTRACTOR
M.O.D. (N)
TITLE
C.S.C LINE & TRAFFIC SWITCHING ARRANGEMENTS
PUNCH CARD TITLE

SECURITY CLASSIFICATION
RESTRICTED
CONTRACTOR'S DRAWING NUMBER
SERVICE DRAWING NUMBER/SHEET NUMBER
8 2 7 9 3 6 SHT. 1

SECURITY CLASSIFICATION
RESTRICTED
SERVICE DRAWING NUMBER / SHEET NUMBER
827966

32



ISSUE	DATE	CHANGE
10	14. 7. 83	AMENDED.
09	24. 6. 83	REDRAWN
08	5. 7. 82	AMENDED.
07	19. 11. 81	
06	18. 6. 81	HYBRIDS DELETED.
05	1. 4. 81	AMENDED
04	25. 11. 80	AMENDED.
03	27. 6. 80	
02	10. 4. 80	AMENDED.
01	11. 3. 80.	
A	2. 9. 79	

CERTS
CHECKED
DRAWN R.Street 138

AMENDED
AMENDED.
CSC SEC. ADDED
AMENDED CSC SEC DELETED
AT & S UNITS WERE CSU's.

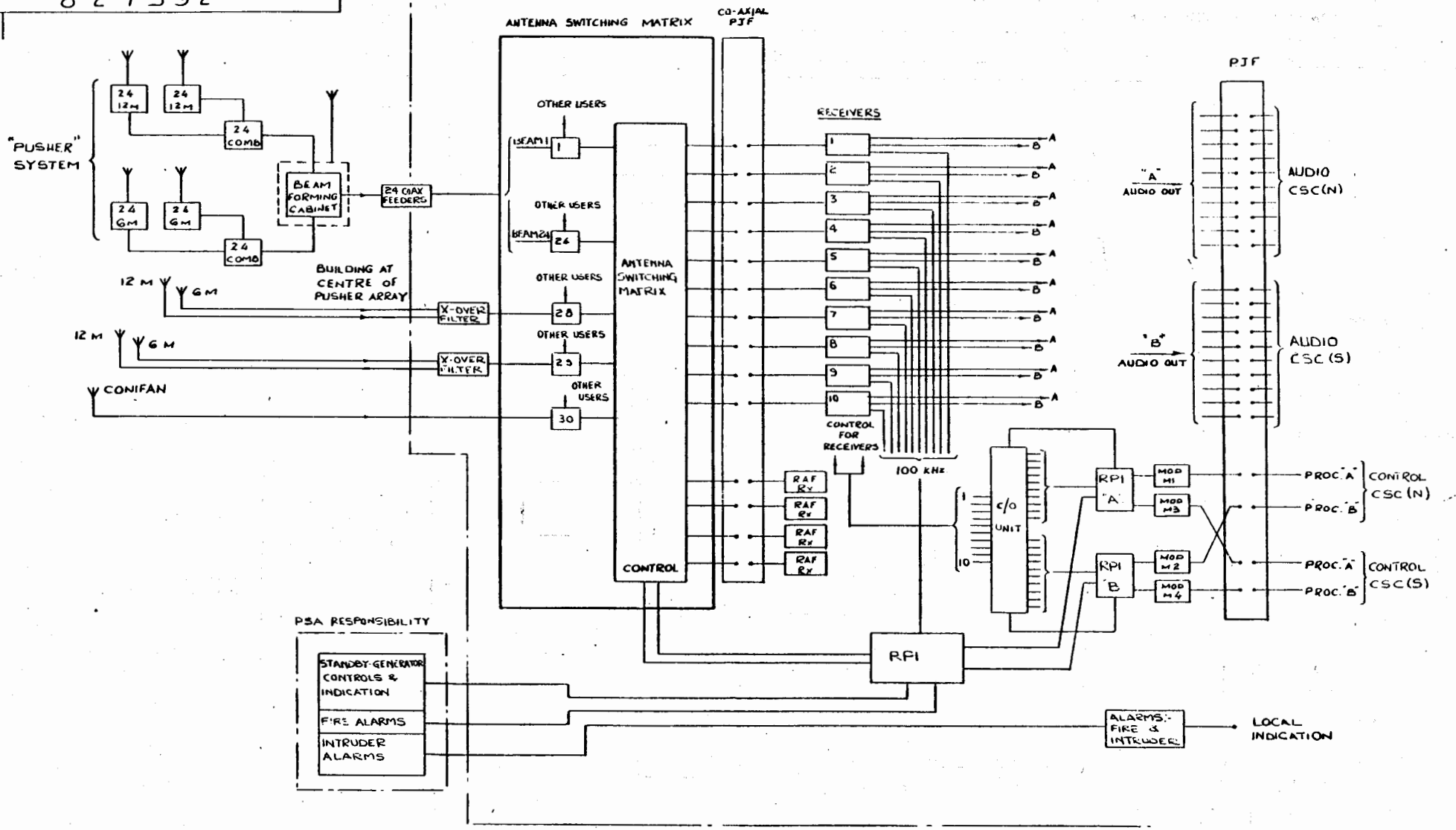
CONTRACTOR
MOD(N)
TITLE
BLOCK SCHEMATIC. PROPOSED
NSR 7345 TRANSMITTER STATION.
PUNCH CARD TITLE,

SECURITY CLASSIFICATION
RESTRICTED
CONTRACTOR'S DRAWING NUMBER
SERVICE DRAWING NUMBER / SHEET NUMBER
827966

SECURITY CLASSIFICATION
RESTRICTED
SERVICE DRAWING NUMBER / SHEET NUMBER
827992
USED ON

34

RECEIVER BUILDING

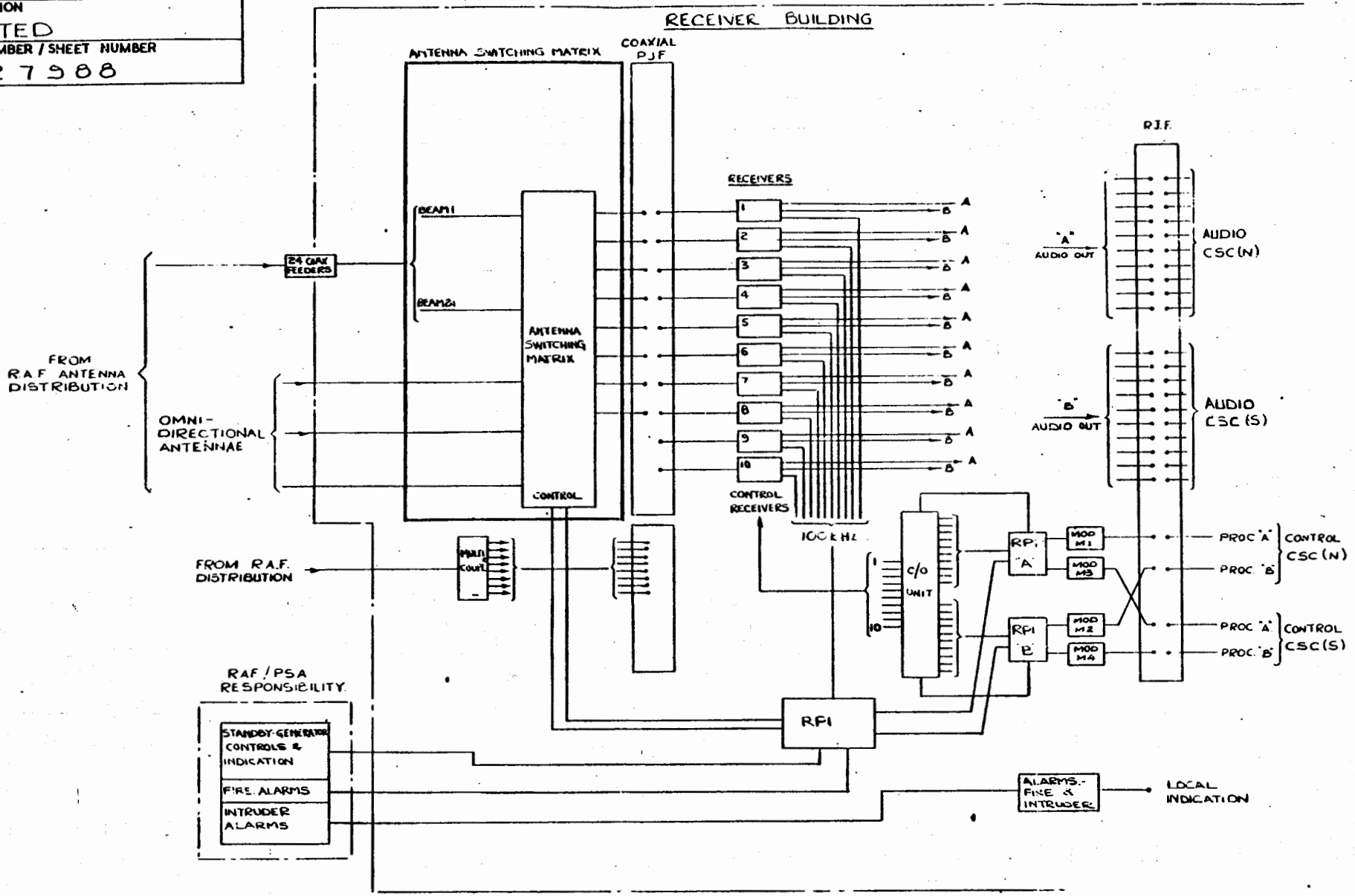


CERTS				
CHECKED				
DRAWN A.KEMPNISH 13B				
	CHANGE	ISSUE	DATE	
	AMENDED	05	1.6.83	
	AMENDED	04	5.7.82	
	AMENDED	03	18.11.81	
	AMENDED.	02	31.3.81	
		01	11.3.80	

CONTRACTOR
M O D (N)
TITLE
PENHALE RECEIVING STATION
NSR 7345 BLOCK SCHEMATIC
PUNCH CARD TITLE.

SECURITY CLASSIFICATION
RESTRICTED
CONTRACTOR'S DRAWINING NUMBER
SERVICE DRAWING NUMBER / SHEET NUMBER
827992

SECURITY CLASSIFICATION
RESTRICTED
SERVICE DRAWING NUMBER / SHEET NUMBER
827988
USED ON



CHANGE	ISSUE	DATE
I/F DELETED	06	1.6.83
AMENDED	05	5.7.82
AMENDED	04	18.11.81
AMENDED	03	31.3.81
AMENDED	02	15.5.80
	01	11.3.80

CERTS
CHECKED
DRAWN A.KEMMISH 13B

CONTRACTOR
M.O.D.(N)
TITLE
KINLOSS RECEIVING STATION
NSR 7345 BLOCK SCHEMATIC
PUNCH CARD TITLE,

SECURITY CLASSIFICATION
RESTRICTED
CONTRACTOR'S DRAWINING NUMBER
SERVICE DRAWING NUMBER / SHEET NUMBER
827988