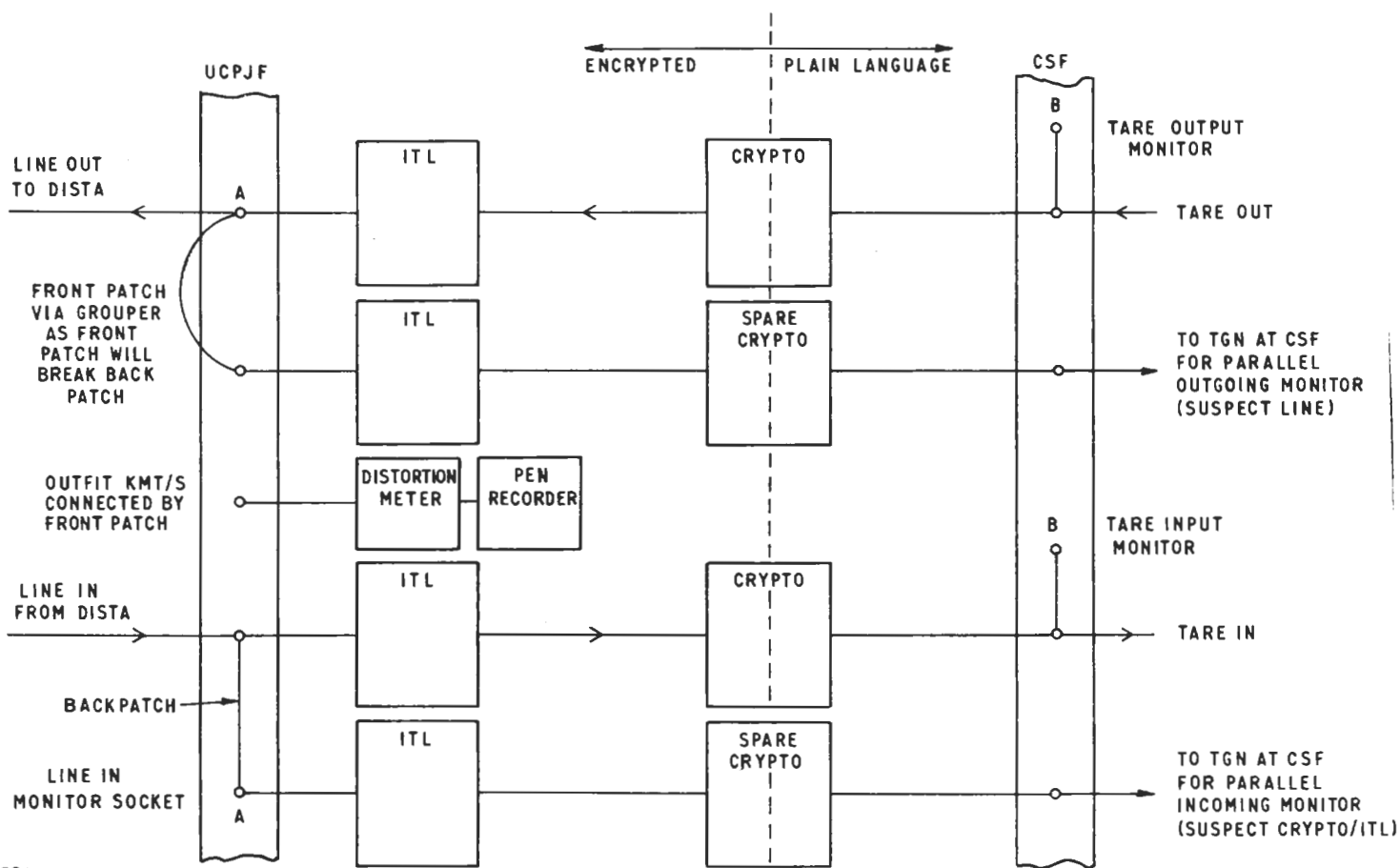


FIG 6.4 COMCEN MONITORING POINTS



NOTES:

1. POINTS A MAY BE MONITORED ON TDSA.
2. POINTS B MAY BE MONITORED ON TDSA AND TGN.

86. RAF OAKHANGER act as the control for the satellite trunk (and will do more so for SKYNET IV), extending the channels to the user COMMCENS. Engineering is simplified by the connection of COMMCEN, OAKHANGER and MOBILE together on an engineering link. When a ship is operating through a NATO satellite, it is possible that the route is via several ground stations as an aid to training ground terminals in handling ship traffic. All these stations are connected on the engineering circuit.

87. Most engineering traffic is between MECC and the ship, concerning power levels etc. Quality of traffic is so good that commcens have little involvement except to discuss crypto problems. A short downtime will occur should ships require to change satellite (West to East traverse of Australia). Similarly programmed downtime at OAKHANGER occurs monthly when the whole station closes down for routine maintenance. During these periods and during any unprogrammed downtime a reduced satellite service is provided by RSRE DEFFORD. Plans are in hand and building has commenced to extend and modernise OAKHANGER as well as to provide an alternative SGT.

88. RECORDING AND REPORTING (DCN) (JSP 321)

In order to initiate CDCN follow-up action and to allow analysis of the network, certain reports are called for in JSP 321. The reports are based on the records kept over each 24 hours for:

- (1) Trunk Bearer.
- (2) Each Common-User Channel.
- (3) Each Exclusive-User Channel.
- (4) Conference/SPH Channels.
- (5) Speech Channels.
- (6) Data Channels.

Records are maintained by SCPs on MOD Form F151.

89. The form is designed to allow monitoring and recording of circuits at 15 minute intervals. Instructions on completion and the Outage Codes in use are published in JSP 321 Part 3 Leaflet D2 and its ANNEXES. This form is the basis of all circuit performance reports and is used throughout the system.

90. REPORTING TO CDCN (JSP 321 Part 3 Leaflet D3)

Reports are made to CDCN by a number of routine signals published in the reference.

- (1) COMMREP - Submitted daily, shortly after midnight showing the availability of DCN trunks and CU channels in the manner shown at ANNEX to the Reference. Daily Threshold times are published in DCNP 4 Leaflet B8. Signal is usually drafted by the WSC for release by the DEO and is to be available for analysis by CDCN operations room staff by the start of the next working day.
- (2) DISREP - The availability of all other telegraph channels is reported by Discrepancy Report (DISREP) in the format shown at ANNEX C to the Reference, compiled in accordance with the Reference.
- (3) PATCHREP - Raised in accordance with the Reference for a pre-booked DCN patch which is delayed by any time at all for a COS, or by over 15 minutes for any other patch. Unbooked or SPH patches have a threshold of 30 minutes. An example may be found at ANNEX D to the Reference. Additionally CDCN calls for a monthly Patch activation summary, an example of which is published at ANNEX E to the Reference.
- (4) Miscellaneous Reports - Other miscellaneous reports may be called for on special occasions, ie:
 - a. Post Exercise Report - raised by all active participants is exercises involving CRLs or other operations. Format shown at ANNEX F to the Reference.
 - b. Detailed Communication Report (DCR or SINPO) - called for to study a particular trunk or channel which has consistently failed to meet its threshold for several COMMREPS.

91. MAINTENANCE (JSP 321 Part 2 Leaflets C1-3)

CDCN employ a formal documentation system for two types of maintenance and the effects produced on availability of channels and traffic flow in the network. Maintenance policy itself is laid down by MOD Sponsor Branch, (ie STMA). It should be planned to interfere as little as possible with user requirements and yet must not be sacrificed to the degree that excessive equipment failures occur, causing an even greater loss of user facilities.

92. Preventive Maintenance

As far as possible when a piece of equipment is required for preventive maintenance it must be replaced by a spare item with minimum disruption to the user. If this is not going to be possible, then a minimum of 14 days notice is required from the operational authority. Formats for these signals are published as ANNEXES A, B and C to LEAFLET C2 of the Reference.

93. CORRECTIVE MAINTENANCE

Despite preventive maintenance some failures will occur. These may often be circumvented by the rapid replacement by a serviceable item and adequate switchable or patchable maintenance spare equipment should be available for this purpose. This would not be possible in the event of the loss of a whole station (power supplies) or may involve the defective item being replaced by one of inferior performance (ie a lower power HF transmitter). Three signal formats are published at ANNEXES A, B and C to the Reference to allow CDCN and all active participants to be informed of the failure.

- (1) Major Breakdown - where more than one service is affected eg WHITOUT, OAKOUT for a period above 1 hour.
- (2) Significant Outage - breakdown of one service or channel within a service lasting for more than 4 hours.
- (3) Degraded Capability - in the event of defective equipment being replaced by equipment of a lower capability, for a period exceeding 6 hours.

94. INTERFERENCE REPORTS (JSP 321 Part 1 Leaflet C5)

With the congested HF Spectrum and unstable propagation conduction, some interference is to be expected and providing it does not become harmful should be tolerated. When interference is experienced it may be possible to alleviate its effects by:

- (1) Changing frequency.
- (2) Changing sidebands or channels.
- (3) Shifting carrier frequency within the assigned bandwidth.

95. HFECs experiencing harmful interference (QRM) are to report the interference to the Frequency Measuring Section (FMS) at RAF BAMPTON CASTLE who will attempt to identify the source and recommend action to avoid it. BAMPTON may enlist the aid of British Telecom RAD Control at BALDOCK. Interference is reported by the signal format at ANNEX A to the Reference.

96. Should any Service controlled signal be interfering with anyone else, then a report will normally come from BALDOCK to DEO, GYA for action.

97. BAMPTON may be asked to check the emission from a service controlled transmitter should it be suspect. GXQ also offer this service from the COMAL Room. All reports raised by BAMPTON are copy to MOD SIGS 2, CDCN and the terminals of the offended service.

OPERATING SIGNALS USED IN ENGINEERING MESSAGES

1. Z Codes

<u>SIGNAL</u>	<u>QUESTION</u>	<u>ANSWER, ADVICE OR ORDER</u>
ZAA		You are not observing proper circuit discipline.
ZAF	Will you patch me through to .. (via you or ..)	I am about to patch you through to .. (via..)
ZAI		Run..(1. Caller, 2. Test tape, 3. Synchronising tape, 4. Traffic tape, 5. Marking signals, 6. Spacing signals, 7 Reversals, 8. Run teletypewriter space bar signals).
ZAL		I am closing down (until..) due to ..
ZBA	What is the cause of delay (or of bad transmission).	Delay (or bad transmission) due to ..
ZBC		You are transmitting a continuous .. (1. Mark, 2. Space).
ZBZ	What is the printing accuracy of my signals (or those of ..)	The printing accuracy of your signals (or those of ..) is .. (1. Totally corrupt, 2. Very corrupt, 3. Partly corrupt rendering traffic unacceptable, 4. Occasionally corrupt but traffic acceptable, 5. Perfect - no corruptions.
ZBW	Will you shift (or ask .. to shift) to transmit on .. kHz (or MHz).	I am (or .. is) shifting to transmit on .. kHz (or MHz).
ZBX	Will you shift (or ask .. to shift) to receive on .. kHz (or MHz).	I am (or .. is) shifting to receive on .. kHz (or MHz).
ZEV	Request you acknowledge message.	Message (or message ..) is acknowledged.

ZFH		This message (or message ..) is being (or has been) passed to you (or ..) for, (1. Action, 2. Information 3. Comment) at the request of ..
ZFR		Cancel transmission .. (made under channel or station serial number ..)
ZGN	When was I (or ..) last heard.	Nothing heard from you (or ..) (since ..)
ZKJ		1. Close down (until ..) 2. I am closing down (until ..)
ZNI		Shift to 1. On-line, 2. Plain, operation now.
ZOF		Relay (pass) this message (or message ..) to .. now (or at).
ZRD	What is frequency of the ..	The frequency of the .. radio facility now in operation is ..
ZRE	On what frequency do you hear me best.	I hear you best on .. kHz (or MHz).
ZRJ	Will you check your ..	I will check my ..
ZRK		Your bias distortion is .. 1. Excessive. 2. % Marking. 3. % Spacing. 4. TOTAL.
ZRQ		Change to other sideband.
ZTB		1. Transmitter distributor, 2. Auto head, 3. Perforator, 4. Reperforator, 5. Printer, 7. Keyboard, 10. On-line crypto device.
ZTC	1. Does my .. appear to be faulty, 2. Is your .. faulty.	1. Your .. appears to be faulty. 2. My .. is faulty.
ZTE	Are you (or is ..) able to use	I am (or is ..) able to use ..

ZTI		1. Receiver, 2. Transmitter, 3. Power supply, 4. Antenna system, 5. RDF.
ZUB		AT
ZUE		Affirmative (Yes).
ZUG		Negative (No).
ZUI		Your attention is invited to.
ZUJ		Stand-by.
ZZB		1. EDC, 2. Automatic number sender, 3. Tare, 4. Satellite radio.
ZZF		My transmitter power is: 1.5 kW, 2.10 kW, 3.20 kW, 4.30 kW.
ZZG		Your transmissions are not entering TARE because of 1. Incorrect SOMF, 2. Corrupt SOMF.
ZZI		My self addressed channel checks (1. BB, 2. 00) not been received.
ZZJ	Will you monitor my self addressed channel checks.	Send self addressed channel checks and I will monitor.

2. Q Codes

QLH	Will you use simultaneous keying.	I will use simultaneous keying.
QRL		I am busy (or I am busy with ..) Please do not interfere.
QRK	What is the readability of my signals	The readability of your signals is 1 5
QRM	Are you being interfered with.	I am being interfered with 1. Nil, 2. Slightly, 3. Moderately, 4. Severely, 5. Extremely.
QRN	Are you troubled with static.	I am troubled with static 1 5

QRO	Shall I increase transmitter power.	Increase transmitter power.
QRT	Shall I stop sending.	Stop sending.
QRU	Have you anything for me.	I have nothing for you.
QRV	Are you ready.	I am ready.
QSB	Are my signals fading.	Your signals are fading.
QSO	Can you communicate with .. directly or by relay.	I can communicate with .. direct (or through ..)
QSY	Shall I change to transmission on another frequency.	Change to transmission on another frequency.

System and General Engineering Condition Bi-grams

HO	Check your equipment.
DG	Equipment trouble.
DH	Equipment restored.
NA	... is faulty.
LK	Plug field setting for day (change over).
BI	Stand-by (refers only to KW26 equipment).
HA	Stand-by .. until (time).
HF	Have a power failure.
HP	Have circuit trouble.
BG	Radio link poor, use alternative frequency.
LW	Start incorrect, revert to plain language.
LQ	Transmit .. 1. By hand in PL, 2. By hand in CY, 3. By auto in PL, 4. By auto in CY.
KD	BID/610/1.
KG	BID/650.
KH	BID/700.
IP	Go cypher.
IQ	Go clear.
IE	Patch to subscriber.

4. Authorised Abbreviations and Prosigns

AA	All after.
AB	All before.
AE	Aerial.
AR	End of transmission - no response required.

AS	Wait.
BT	Break - separates text from other portions of message.
CCT	Circuit.
CHAN	Channel.
DE	From.
EEEEEEEE	Error.
FDM	Frequency Division Multiplex.
FFD	Four Frequency Diplex.
FM	From Originators Callsign or RI.
FST	Frequency Shift Telegraphy.
HZ	Hertz.
IMI	Repeat or/repeat message or portions of a message as indicated.
INT	Interrogative, to be confined to meanings listed in 'Questions' column of ACP 131.
ICPC	Increase power in (pilot) carrier.
IP	Intermodulation product.
ISB	Independent sideband.
K	Go ahead.
KHZ	Kilohertz.
LSB	Lower sideband.
LUF	Lower usable frequency.
MCVF	Multi-channel voice frequency.
MHZ	Megahertz.
OTA	Off the air.
R	Routine or I have received the last transmission.
SSB	Single sideband.
TDM	Time division multiplex.
TFC	Traffic.
USB	Upper sideband.
WA	Word after.
WB	Word before.
YR	Your.

1. ENGINEERING MESSAGES

As discussed earlier, the system is controlled by the ability of System Controllers to be able to pass messages on their own engineering circuits, or via traffic channels. Some examples of these messages are shown in this ANNEX, excluding MRL signals which may be found in ANNEX D.

2. Messages passed over engineering circuits should be in the standard format as follows:

- (1) Callsign, prosign 'DE', callsign of sender.
- (2) Text.
- (3) Time of transmission.
- (4) Ending sign ('K' or 'AR').

eg GYU DE GYA, ZBC1, ZUB 2010Z, K

All messages are to be acknowledged and time of receipt given:

GYA DE GYU, R, ZUB 2011Z, AR

3. When direct communications between two terminals is not possible it may be possible to relay information via a third control, eg:

GXQ DE GYA, ZOF'GYU ZBC 1, ZUB 2010Z, K

4. OPENING A CHANNEL FOR A PATCH

GYU DE GXQ

K

DE GYU

K

DE GXQ INT ADGI FIT FOR CHN FIVE MY USERS THISTA
REQUIRE SPH SCHEDULE. GIAD FIT FOR CHN FIVE

K

DE GYU ADGI FIT FOR CHN FIVE. OPEN ADGIAD CHN FIVE
FROM CONTROLS

K

DE GXQ R. ZUB 1020Z AR

GXQ DE GYU

K
DE GXQ

K
DE GYU ADGI CHN FIVE ZBZ 5 INT ZBZ GIAD

K
DE GXQ R. GIAD ZBZ 5. ZAF TO USERS ZUB 1030Z

K
DE GYU R. AR.

5. ENGINEERING MESSAGE RELAY

GXQ DE GYU

K

DE GXQ

K

DE GYU ZOF MKG ZFA MLF

QSY RED ON 7.7 TO 13.9

ZUB 1837Z

K

DE GXQ R AR

MKG DE GXQ

K

DE MKG

K

DE GXQ QS E E E 'E E E E E ZFA MLF

QSY RED ON 7.7 TO 13.9

ZUB 1838Z

6. REDUCE TO SINGLE PATH EMISSION

GYU DE GXQ

K

DE GYU

K

DE GXQ GIAD ON 10.3 AND 15.8

ZKJ ONE 15.8

ZUB1230Z

K

DE GYU R AR

7. REQUEST FOR DUPLICATE PATH EMISSION

GXQ DE GYU

K

DE GXQ

K
DE GYU ADGI ON 5- E E E E E E E E
 ADGI ON 5.3 INT QLH ON
 5.3 AND 8.1 AT 0900Z
ZUB 0730Z

K
DE GXQ R AR

8. DCN SITREP

GYU DE GXQ
SITREP
GIAD QSX 10.2 ZGN QLH 8.3 ZBZ 3
ADGI ZRD ZPE 7.8 QLH 9.6
INT ZBZ INT ZBZ
K

As communication is difficult this message would also be written as a Service Message SIC SVC and transmitted to GYU by alternative means.

ENGINEERING CALLSIGNS (ACP 100 COM SUP I(C))

COMMCEN WHITEHALL	GYA
GIBRALTAR (RN)	GYU
RAF GIBRALTAR COMMCEN	MLU
FOREST MOOR	GXQ
INSKIP	GQF
CRIMOND	GZL
PITREAVIE	MTO
FASLANE	MGJ
PLYMOUTH	MTI
PORTLAND	GXW
PORTSMOUTH	MTN
NORTHWOOD NATO	GYI
HONG KONG	GZO
BT RUGBY	GBR
BT PORTISHEAD	GKL
BY CRIGGION	GBZ
BT BODMIN	GYD
BT ANTHORN	GQD
BODDINGTON	MUA
LISBURN	MUG
RAF OAKHANGER	GFK
GCHQ	MEH
CYPRESS COMMCEN	MKD
CYPRESS SATELLITE	MKJ
HONG KONG COMMCEN	GFH
HONG KONG SATELLITE	MKY
LISBON	PCF