THALES DEFENCE COMMUNICATIONS

PANTHER EDR
VHF Airborne Radio System

- **Airborne Radio System**
- **30 - 88MHz**
- **Frequency Hopping and Fixed Frequency**
- **Integral high level digital encryption**
- **Interoperable with ground based Panther EDR**

INTRODUCTION

The Panther EDR Airborne Radio System is a VHF communications system, which provides both Frequency Hopping and Fixed Frequency interoperability with the ground based Panther EDR.

The Panther airborne system has been adapted from the proven JAGUAR-V system, which has been installed in a variety of fixed wing and rotary wing aircraft, such as the MIG 21 and Sikorsky Desert Hawk. This experience which has been proven in the harsh environmental conditions, especially those found in helicopter installations, allows the requirements for Ground to Air/Air to Ground communications to be realised in a high performance system.

AIRBORNE SYSTEM

Complete commonality with the Panther V EDR is achieved by using the Panther V 20W together with the BCC 597E Aircraft Interface Unit and the BCC 584E Control and Display Unit.
The Aircraft Interface Unit provides the power input, audio interface and control interface to enable operation of a Panther VHF radio from an aircraft supply.

The Control and Display Unit enables operation of a Panther VHF radio from a remote position.

The Airborne Radio System equipment and functions are as shown below.

Panther V EDR Transceiver
Air to Ground and Ground to Air Interoperability with Panther EDR

Aircraft Interface Unit (AIU)
Interface to the aircraft intercom system

Control and Display Unit (CDU)
Remote control from cockpit of the transceiver
Programming of operating modes, frequencies and Transec/Comsec keys.

The Audio Communications interface is a proven design, which has been installed in a Sikorsky Desert Hawk. The Airborne Radio System may be remotely controlled from the cockpit CDU.

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Typical Operator Usage Scenario

Remote operation and control of the airborne radio is performed in this example from the CDU equipment. After Zeroising both the crypto and ECCM codes the operator connects the programmer to the Fill socket on the front of the CDU. The operating modes, frequencies and Transec/Comsec keys are automatically sent to the radio over the serial control data link.

Pre-flight testing is performed on the radio by the automatic initiation of the Operational Readiness Test (ORT), when the system is switched on. The ORT uses the BIT capability in the radio and when completed satisfactorily the CDU displays frequency and operating mode. The operator now selects the required frequency for communication by changing the channel switch. If the required frequency is not already programmed in a channel then it may be manually programmed by setting the channel switch to the manual channel position and setting the frequency using the four frequency change switches.

Selection of hopping, fixed frequency and secure (encryption) modes of operation is accomplished with the mode switch, the CDU display is updated with the latest mode and frequency.

The operator selects 'Hi' or 'Lo' power output at the power selector switch and applies pressel via the Intercom System. Once the unready pips if in hopping/secure modes have finished, the sidetone is heard at the operator headset and the operator may communicate over the air.

The Airborne radio may be programmed with the operational information either manually using its front panel keypad or via remote control, or by connecting a programmer or fill gun to either the radio front panel socket or the CDU Fill socket.

The Airborne Radio System is interfaced to the on-board intercom system, which allows any flight crew position to communicate via the radio.

The Airborne Radio System allows two way data and voice communication between ground and airborne systems in the following modes.

- Analogue Voice from 300Hz to 3kHz
- Analogue Data including FSK to 3kHz
- Digital Voice at 16kb/s
- Digital Data to 16kb/s, including Forward Error Correction for data of up to 9.6kb/s on air

Panther EDR

TECHNICAL SPECIFICATION

Parameters

Frequency Range	30Mhz to 88MHz
Number of Channels	2320
Number of Pre-set Channels	8
Channel Spacing	25kHz
Power Output	100mW, 5W or 20W
Supply Voltage	28 volts
Working Temperature	-40˚ to +70˚C
Microphone Sensitivity (ICS)	390mV rms into 150 ohms
Audio Output	2.75V rms into 150 ohms (Max. volume control position)
Pressel	1.8V or 1.2k ohms to earth
Antenna	Any suitable 50 ohms antenna

Facilities

(a) BCC 597E

Input supply:	28V dc aircraft supply
Output supply:	12.6V to radio and 584E
Protection against:	Voltage spikes and surges in aircraft supplies; supply input polarity reversal, short circuit of output
Audio Interface:	Audio to radio and aircraft intercom system
Control Interface:	Control and display information between radio and control unit
Weight and Dimensions:	Width 230 mm Height 99 mm Depth 100 mm Weight 2.3 kg

(b) BCC 584E

Input Supply:	12.6V from BCC 597E
Remote Control:	
Selection of following facilities:	
	Working channel Frequency of Manual Channel Mode Power Output Zeroise Setting of own Address code
Display:	Channel and mode selected for channels 1-7. Frequency and mode selected for manual channel.
Weight and Dimensions:	Width 146 mm Height 66 mm Depth 116 mm Weight 0.8 kg

Controls and Indicators

(a) BCC 597E

No controls and indicators are fitted to the 597E

(b) BCC 584E

Volume Control:
Controls audio level to BCC 597E ICS socket

Display Brightness Control (BRT):
3 way switch for 8 present levels - right to increase brightness

Frequency Control:
4 controls, 3 way switches, up and hold to increase frequency, down and hold to decrease frequency. Only operational on M channel

Zeroise Control (PULL Ł ZERO):
Pull out and push to right to cancel frequencies and codes stored in the radio

Power Output Control (LO/HI):
2 way switch to set RF power from radio;
Lo for low power output Hi for high power output

Mode Control:
2 way switch, push to change 4 modes in sequence:
Fixed frequency FM clear speech;
Fixed Frequency FM secure speech (S);
Hopping frequency slave station (h);
Hopping frequency station (H)
Channel Control:
8 position switch;
M - manual channel (O) plus channels 1 to 7

Display Test Control:
3 way center-biased switch;
In normal mid position shows frequency and mode for M channel or channel number for 1 to 7
In SQ TEST (left) position the radio squelch is opened and the frequency and mode of the selected channel is displayed
In DISP TEST (right) position all display segments are tested by showing 8s in each position

On/Off Control:
3 way switch;
OFF - supply of to radio;
T/R - supply on to radio;
SEL - selective address code assigned will be displayed

The Display Indicators:
7 character display (6 + 1 format);
positions 1 to 6 - frequency;
position 7 - mode selected
(A blank space exists between position 6 and 7 for clarity in reading the display)
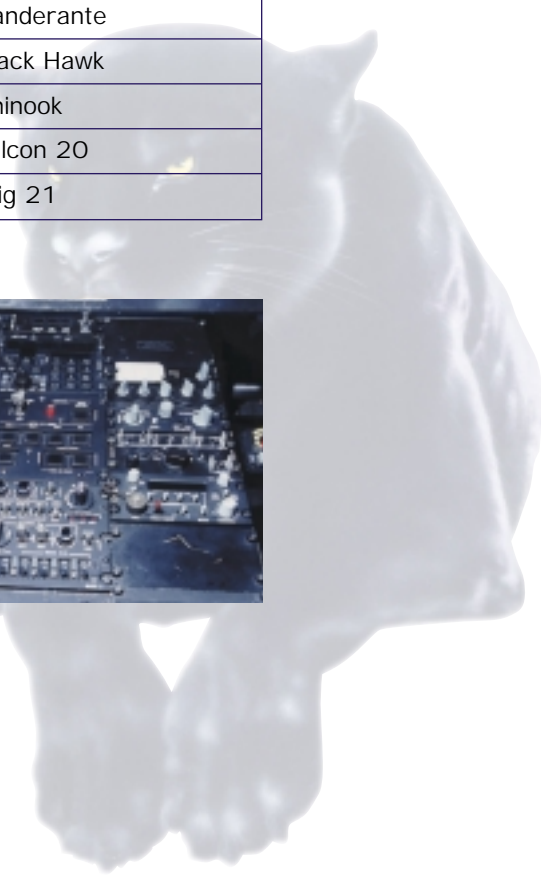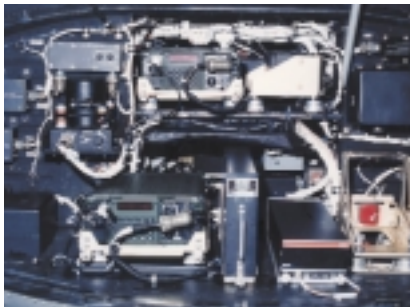
SUCCESSFUL AIRBORNE PLATFORM INTEGRATION

10 types in over 20 countries

Aerospatiale	Super Puma
	Dauphin
Sikorsky	Desert Hawk
Bell	Combat Scout
Boeing	Apache
Embraer	Banderante
Westland	Black Hawk
Augusta	Chinook
Dassault	Falcon 20
Mikoyan	Mig 21

Panther **EDR**

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