S1c Daytona Specification

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Subject: S1c Daytona Specification

Revision History

(This table will be filled in from V1.0 onwards, V1.0 being the first complete version of this document.)

Version	Date	Author	Comment
V1.0	6th March 2006	Richard Davies	First reviewed version.

Distribution

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Table of Contents

List of References

Ref	Title	Document Number
1	Product Requirement Specification	C7032-RS-001
2	Architecture Specification	C7032-S-003
3	Baseband Electronics Design Specification	C7032-S-007
4	H1c transceiver board design approach	C7478-TM-002
5	H1c transceiver board schematics	C7478-DL-001
6	Audio Interface pcb	C7032-DL-010
7	Accessory Interface pcb	C7032-DL-009
8	SIM board for LBT	C7478-DL-003
9	Antenna Latch for LBT	C7478-DL-007
10	'SuperCap' Reservoir Capacitor pcb	C7478-DL-005
11	DPL Protocol and Hardware Specification	C7032-S-018

1 Introduction

This specification describes the Iridium S1c Daytona L-band transceiver (LBT). This will be sold as a 9522A L-band transceiver. This is the same description as the previous version derived from the Monaco H1b handset. For the purposes of this document the previous version of the LBT will be referred to as the S1b Daytona.

The mechanical casework remains identical to the older Sebring 9522 LBT.

The LBT is housed in a metal case. It requires an external power supply and has no keyboard or display. The user interface takes the form of a 25-way D type connector which presents various audio and data interfaces. External systems such as data terminals or telephony handsets connect to this interface.

2 Headline Specification

Physical Specification	
Length (with antenna connector)	216.1mm (8.51")

Length (without antenna connector)	196.4mm (7.73”)
Width	82.6mm (3.25”)
Depth	39.0mm (1.54”)
Weight (approximate)	610g
Environment Specification	
Operating Temperature Range	-20^{o}C to +60^{o}C
Operating humidity range	<85% RH
Storage temperature range	-40^{o}C to +85^{o}C
RF Interface Specification	
Frequency Range	1616MHz to 1626.5MHz
Duplexing method	TDD (Time Division Duplex)
Oscillator stability	±1 ppm
Input/Output impedance	50 Ohms
Multiplexing method	TDMA/FDMA
DC Power Input Specification	
Main input voltage range	+4.0VDC to +4.8VDC
Main input voltage nominal	4.4VDC
Main input voltage ripple	40mVpp
Peak input current (maximum)	3 A @ 4.4VDC
Main input active power (average)	4 Watts (Data call) 2 Watts typical voice call with good path to satellite
Main input standby power (average)	600mW

3 Interfaces

3.1 Antenna

The Daytona LBT antenna interface shall be presented on a standard 50Ω TNC coaxial connector mounted on the end of the LBT case.

3.2 User Connector

The User Connector is a 25-way D-type plug. The user interfaces carried on this connector are:-

- DC power
- Analogue audio
- Digital audio
- Digital Peripheral Link
- RS-232 Port

3.2.1 DC power

The LBT requires an external DC power source of 4.4V ± 0.4V which shall be capable of supplying current of at least 3A to meet the peak demand of the unit when transmitting at full output power.

When power is supplied to the Daytona it will turn on.

3.2.2 Power On/Off Control

An external on/off input shall be provided on a pin of the 25-way D connector as shown in table 1 below.

The EXT_ON_OFF control input is used to turn a powered Daytona on and off in a toggle fashion. The EXT_ON_OFF control input is normally left "floating" (i.e. high). It is pulled to GND level (i.e. low) for at least 270 ms then released to cause the Daytona to alternate from its current on/off state as shown in Table below

Daytona Start State	**EXT_ON_OFF Control Input**	**Daytona End State**
Power is supplied, EXT_ON_OFF is floating, unit is off	EXT_ON_OFF is pulled to GND for at least 270ms then released	Power is supplied, EXT_ON_OFF is floating, unit is on
Power is supplied, EXT_ON_OFF is floating, unit is on	EXT_ON_OFF is pulled to GND for at least 270ms then released	Power is supplied, EXT_ON_OFF is floating, unit is off

The signal shall be deemed to be asserted when the voltage level on this pin is 0.5V or less.

The leakage current from this pin in the floating state shall not exceed 10 μA.

The voltage at this pin in the floating state will be approximately 0.4 Volts below the DC supply voltage.

This pin may be voltage driven provided a series resistor of at least 2.2 kOhms is used, and the logic high level is between (Vsupply – 0.4) Volts and 5.5 Volts.

3.2.3 Analogue Audio

Analogue audio input and output ports shall be provided on pins of the 25-way D connector as shown in §3.2.7 below. These shall operate with same nominal levels and configuration as the equivalent ports on the Sebring LBT as follows.

The analogue audio input port shall be a single-ended (unbalanced) input, presenting a minimum impedance of 10kΩ to ground. Nominal input level shall be 110mVp-p, and the LBT shall be able to accept a maximum input level of 2.0Vp-p without signal distortion (provided that its internal gains are set appropriately).

The analogue audio output port shall be a single-ended (unbalanced) output, capable of driving an impedance of 600Ω or more. Nominal output level shall be 110mVp-p and the LBT shall be able to deliver undistorted audio up to 2.0Vp-p at this port.

3.2.4 Digital Peripheral Link (DPL)

The DPL interface is composed of two ports: a full duplex asynchronous serial link for control messages and a PCM digital audio link for audio traffic. The protocol used on these ports is identical to other Monaco family products, see reference [11].

3.2.4.1 DPL Control

The DPL control (sometimes referred to as DPL UART) port shall be presented on pins of the 25-way D connector as shown in §3.2.7 below. *At the transceiver board, these signals operate at 3.15V logic levels.*

By use of configuration links inside the Daytona case, it shall be possible to configure the DPL control port as presented at the 25-way connector to operate either at standard RS-232 signalling voltages or at 2.9V logic level.

3.2.4.2 DPL Audio

The DPL digital audio port shall be presented on pins of the 25-way D connector. These signals shall operate at 2.9V digital levels as specified in reference [11].

3.2.5 Data / Fax

The data / fax port from the transceiver port shall be presented on pins of the 25-way D connector as shown in §3.2.7 below. This port shall operate at RS-232 standard signalling voltages, and provide the following signals:

- S_TX (transmit serial data input to LBT),
- S_RX (receive serial data output from LBT),
- DTR (data terminal ready input to LBT),
- DSR (data set ready output from LBT),
- RTS (request to send input to LBT),
- CTS (clear to send output to LBT),
- RI (ring indication output from LBT), and
- DCD (data carrier detect output from LBT).

3.2.6 90ms Synchronization Input

This input is used in testing only.

3.2.7 User Connector Pin Assignment

The 25-way male D type connector which carries the major interfaces to the LBT shall have a pin out as shown Table 1 below.

Contact	Signal	Description
1	EXT_ON_OFF	External connection for On / Off key input to Daytona LBT
2	EXT_11HZ	90ms “frame sync” signal (used in testing)
3	EXT_GND	Power Ground input to Daytona LBT
4	EXT_PWR	Power input to Daytona LBT
5	SPKR_AUD	Speaker audio output from Daytona LBT
6	DA_TX	PCM digital audio output from Daytona LBT
7	DF_RI	Data / Fax Ring Indication output from Daytona LBT
8	DF_RTS	Data / Fax Request to Send input to Daytona LBT
9	DF_S_TX	Data / Fax (UART) data input to Daytona LBT
10	DF_DCD	Data / Fax Data Carrier Detect output from Daytona LBT
11	DA_FS	PCM digital audio frame sync output from Daytona LBT
12	DA_CLK	PCM digital 2.048MHz audio clock output from Daytona LBT
13	DF_S_RX	Data / Fax data (UART) output from Daytona LBT
14	0V	Signal ground, 0V signal reference and return
15	MIC_AUD	Microphone audio input to Daytona LBT
16	EXT_PWR	Power input to Daytona LBT
17	EXT_GND	Power Ground input to Daytona LBT
18	DPL_TX	Digital Peripheral Link (UART) data output from Daytona LBT
19	DF_DTR	Data / Fax Data Terminal Ready input to Daytona LBT
20	DPL_RX	Digital Peripheral Link (UART) data input to Daytona LBT
21	DF_DSR	Data / Fax Data Set Ready output from Daytona LBT
22	DF_CTS	Data / Fax Clear to Send output from Daytona LBT
23	0V	Signal ground, 0V signal reference and return
24	DA_RX	PCM digital audio input to Daytona LBT
25	0V	Signal ground, 0V signal reference and return

Table 1: 25-way connecor pin-out

3.3 Internal SIM

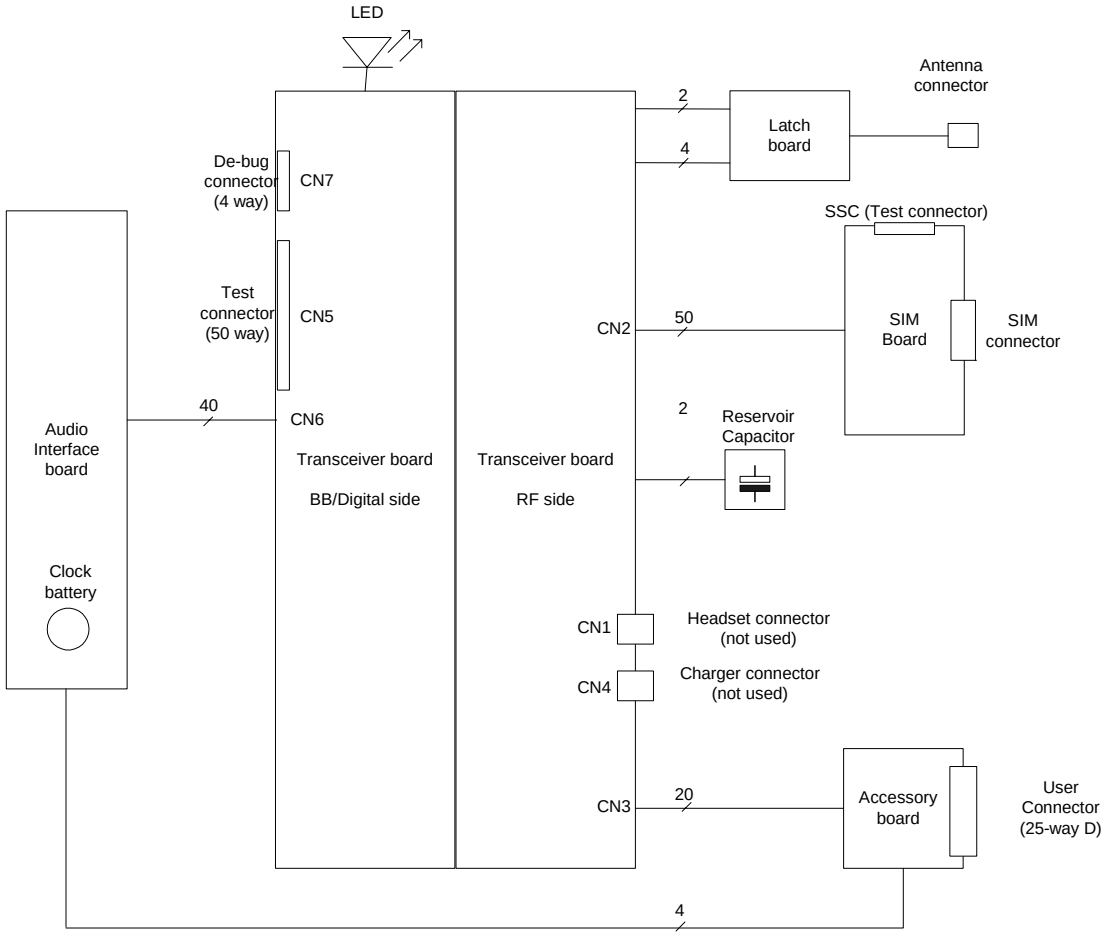
The LBT's internal SIM interface shall support small (postage-stamp) GSM-type SIM cards operating at 3V or 1.8V voltages.

3.4 Super Secret Connector (SSC)

The SSC connector on the baby board shall be used in the Daytona LBT for development and programming signals. The pin allocation of this connector is given in reference 3.

4 Major functional blocks

The major functional blocks of the S1C Daytona LBT are shown in the figure below.



4.1 Transceiver board

The transceiver board is the same as is used in the H1c handset. The design approach is described in reference [4], the schematics are in reference [5].

4.2 Audio interface board

The Audio Interface Board is identical to that used in S1b Daytona, but the components and materials are selected for RoHS compliance. The schematics are in reference [6].

4.3 Accessory board

The Accessory Board performs the same functions as the Accessory board used in S1b Daytona. The only difference is that the signal ground and DC supply negative connection are kept separate on the new board. This takes best advantage of the improved grounding on the H1C transceiver board. The components and materials are selected for RoHS compliance. The schematics are in reference [7].

4.4 SIM board

The SIM Board is identical to that used in S1b Daytona, but the components and materials are selected for RoHS compliance. The schematics are in reference [8].

4.5 Antenna Latch board

The antenna latch board is very similar to that used in S1b Daytona. Some un-used components were removed and the components and materials are selected for RoHS compliance. The schematics are in reference [9].

4.6 Reservoir capacitor assembly

The reservoir capacitor assembly is identical to that used in the S1b Daytona and the handset, but the components and materials are selected for RoHS compliance. The schematics are in reference [10].