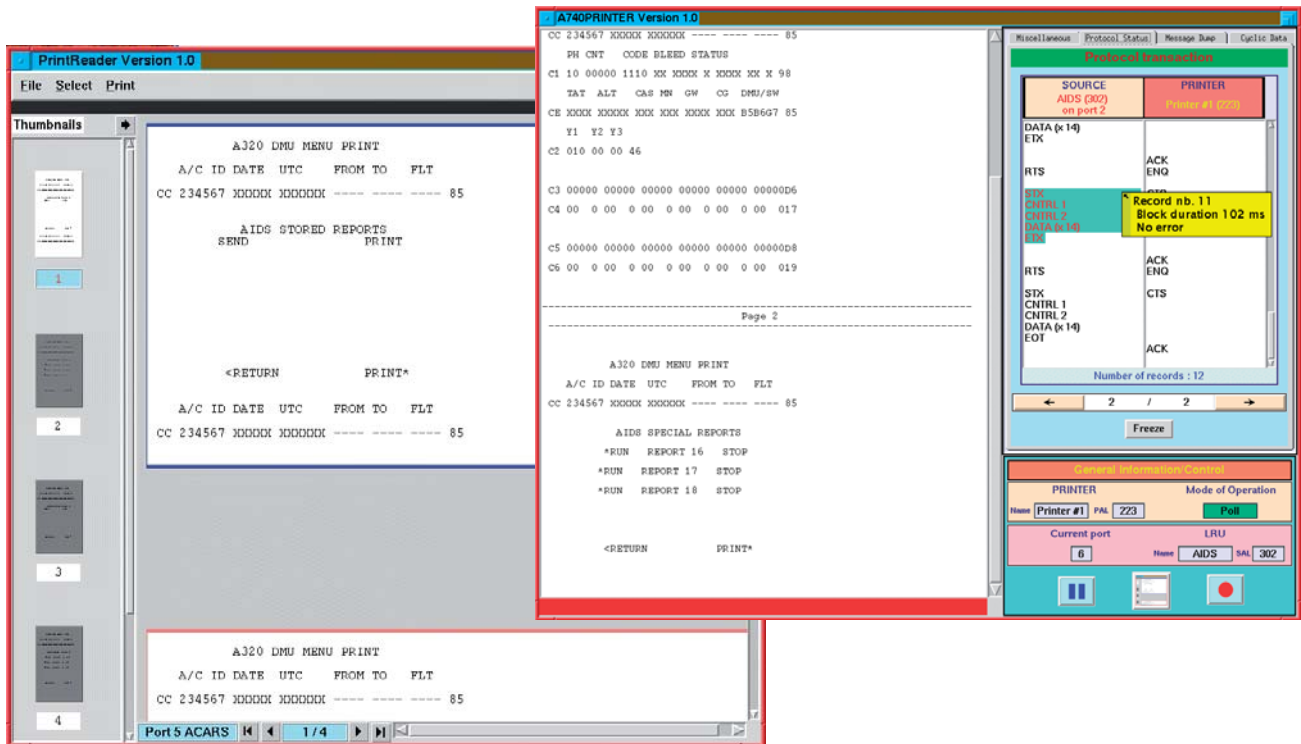




## A740CPS ARINC 740 Cockpit Printer Simulation



- Protocol configuration, stimulation, and analysis
- Error injection and detection
- Integrated utility to generate hard copies





# A740CPS ARINC 740 Cockpit Printer Simulation

## General

The A740CPS simulation application, implemented in the platform-independent Tcl/Tk script language, allows simulating one ARINC Characteristic 740A cockpit printer following the ARINC Specification 429, „Mark 33 Digital Information Transfer System (DITS)” data exchange protocol.

## A740CPS GUI

On the left-hand side of the simulation’s main window (see front) there is a scrollable text area representing a sheet of paper where the messages received from the selected source LRUs are displayed in real time with preset colors and fonts. A horizontal page count separation line delimits the pages from one another.

On the right-hand side, there are two more panes providing additional controls for configuration, stimulation, and analysis. The lower pane, labeled General Information/Control, is indicated permanently. It shows the current printer number and address, input port number, source LRU name and address, and the operation mode. Furthermore, it contains pushbuttons to pause and restart the printing process, assign a printer recording file and start logging to it, and finally launch the offline ReadPrinter utility, which is used to view and print the logged printer data.

The upper pane provides access to four additional panels, which are invoked one at a time via a tab button bar:

**Miscellaneous** – Provides controls to configure printer operation options, including protocol error injection, definition of timeout responses expected from the LRU, selection of printer and printer address label (#1 – 223; #2 – 224), and definition of input port and alternate operating parameters (printer waiting delay for label #172, non-default SAL).

**Protocol Status** – Displays the ARINC 429 data transactions between the printer simulation and the source LRUs sending data to print. A protocol history navigation bar allows browsing handshake information of up to 20 previously printed pages.

**Message Dump** – Allows creating a dump of the last STX-EOT message. The data is displayed both in binary and ISO5 format. A history buffer allows browsing the handshake transactions of the last 20 pages.

**Cyclic Data** – Used to set the Printer Status Word’s value, define up to three monitor words, and monitor periodic data both from the printer and one LRU at a time.

## PrintReader Utility

This versatile utility (see front), which can be started from within the Printer simulation or stand-alone, allows reading and printing data received from the simulated printer. The tool supports many view and navigation options, including browse buttons (Previous, Next, First, Last Page) and thumbnail navigation, full-file or selected viewing (LRU(s), port(s)) and printing to a PS printer or into a file (PS or PDF format).

A Print Preview function allows checking the output before actually printing it. Headers and footers can be added, comprising operator name, date and time, file name, page number and total page count. Text lines can be numbered automatically.

**Error Injection**

- Normal Operation
- No CTS after RTS
- Lower Record Count in CTS
- No ACK/NAK after EOT (2)
- NAK sent after EOT

**Timeouts Definition**

ENQ ---> RTS: 380 (range 100-500)

CTS ---> STX: 390 (range 100-500)

**Printer Selection**

PRINTER: No 1, PAL 223

**Waiting delay for label 172**

1 ms

**LRU Definition**

Input port: 4

Name: SAL

LRU: Spare, 306

Buttons: Submit changes, Reset to defaults

**Cyclic Data**

**Printer Status Word (Label 350)**

3	33	2222222222111111	111	19	
2	10	9876543210987654	321	0	87654321
1	00	0000000000000000	000	01	11111000

**User defined Monitor words (from LRU)**

Port 1: Undefined, Label 350 SDI XX, Undefined

**Cyclic Data Monitoring**

Label	Counter	Hex. value	Update rate	
<b>Printer defined labels</b>				
350	1957	0x0000117	1000	ms
377	1950	0x00101FF	1000	ms
<b>User defined monitor labels</b>				
172	46	0x000435E	999	ms
	0			ms
350	58	0x0000017	484	ms
	0			ms