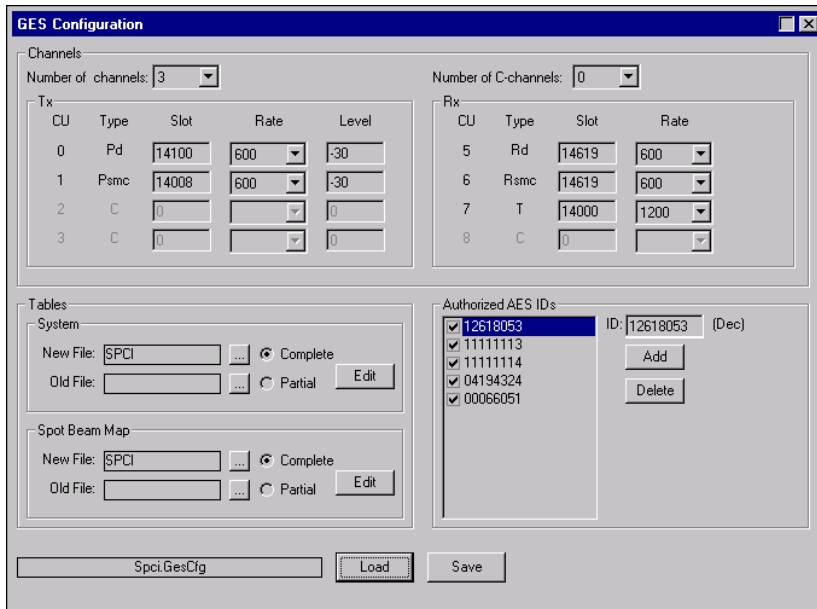# Square Peg Communications Inc.

Inmarsat Aeronautical GES Emulator

OVERVIEW

The Square Peg Communications Inc. (SPCI) Ground Earth Station (GES) emulator provides a simple and flexible means of testing the operation of Aeronautical Earth Stations (AESs) and end-to-end applications for the Inmarsat Classic Aero service, without the expense of airtime charges. It can be used to test basic AES functionality, including Aero-I/H+ and Aero-H voice calls, and data transfer applications such as ACARS.

The emulator implements a simplified GES. It transmits P-channels to the AES and receives R-channels from the AES, both for system management and for data traffic. It also receives T-channel data traffic from the AES and supports the T-channel reservation protocols. The emulator supports circuit switched services over both 8,400 and 21,000 bps C-channels.

The emulator maintains a list of valid AESs, and handles logons by and calls to or from any AES on the list. Multiple simultaneous calls can be supported, depending upon the hardware configuration.

Aero-I/H+ calls are supported by external SPCI Voice Codec Units (VCUs) connected to the emulator. The VCU provides a standard 2wire or 4wire analog phone connection, enabling an end-to-end voice conversation to take place between the emulator and the AES handset. The encoded voice stream from an AES can also be looped back to the AES handset.

The emulator supports Data-2 services over the P, R and T channels at all SDM-defined data rates. Data traffic can be exchanged with an external application (e.g., an ACARS server) over a UDP-based link service user interface. Communication of ACARS data over an X.25 WAN interface (e.g., to the SITA or ARINC network) is also supported. A basic ACARS messaging exerciser is included, which can provide automated acknowledgements of downlink messages and responses to ACARS UTC time requests. Free-text messages can also be generated.

The GES emulator is based on the SPCI Aeronautical Ground Data Unit (GDU), which can also be used for detailed physical layer and protocol testing of AESs and GESs. The same hardware platform supports similar physical layer and protocol test applications for other Inmarsat services such as Swift64 and SwiftBroadband.
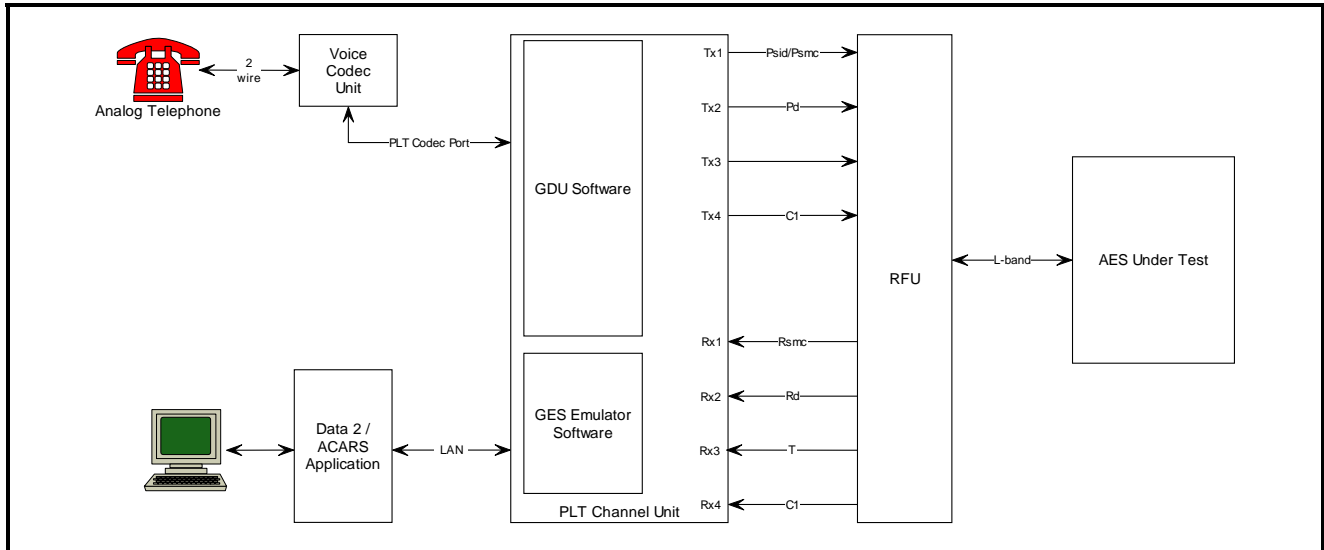
Example GES Emulator Configuration

![globe icon] # SPECIFICATIONS

EMULATOR COMPONENTS

PLT Channel Unit (CU) with Sync I/O interface(s)	**Sync I/O interface required for operation with VCU**
	Optional X.25 interface
PLT RFU Unit and high power attenuator	**High power attenuator required if interfacing after HPA**
GDU software	**Ground Data Unit application**
	GES emulator application
Voice Codec Unit (VCU)	**Aero-I/H+ codec with 2W or 4W interface, or customer-furnished Aero-H codec**

SUPPORTED SCENARIOS

Terminal types	**Aero-H/Aero-H+/Aero-I/Aero-L**
AES class	**1, 2, 3 or 4**
Number of simultaneous AES logged on	**1**
Circuit-mode services	**Aero-I/H+ voice calls (4.8 kbps AMBE)**
	Aero-H voice calls (9.6 kbps LPC)
Maximum number of calls	**Shared Rd/Rsmc: 2**
	Independent Rd/Rsmc: 1
Packet-mode services	**Data-2**
P/R/T-channel bit rates	**600, 1200, 2400, 4800, 10500**

VOICE CALL ROUTING

Air-to-ground	**Initiated by AES; dialed number determines terminating interface**
Ground-to-air	**Initiated via GUI; dialed number determines AES and terminal ID**
Air-to-air	**Initiated by AES; dialed number determines terminating AES and terminal ID (audio loopback if same)**

DATA INTERFACES

Data-2	**UDP interface with external link service user**
	X.25 WAN to packet network
ACARS	**Simple ACARS link service user application is included**

- **Response to UTC time requests**
- **Acknowledgement of other downlink messages**
- **Transmission of free text uplink messages**

EXAMPLE CONFIGURABLE PARAMETERS

Ocean region	**System Table**
	Spot Beam Map
	Operating frequencies/power
Satellite ID and GES Psmc/Rsmc frequencies	**Obtained from currently selected System Table**
Authorized AESs	**List of authorized AES IDs**
Dialing strings	**Map dialed numbers to VCU port or AES loopback**

![globe icon] # CONTACT US

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