Channel Emulator Facilities from CCSR

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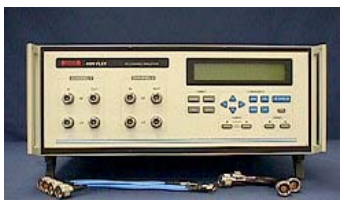
Presentation Content

- Original purpose of the channel emulators
- Principles of channel Emulation
- Schematic setup of channel emulators
- Operation and set up – what extra equipment would be needed for use?
- Useful specifications



Original Purpose

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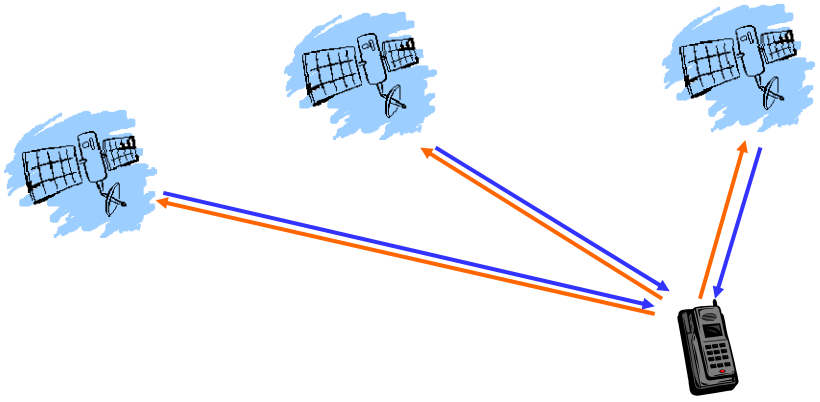
- For emulating three independent uplink and downlink inter-satellite channels



Emulation Usage

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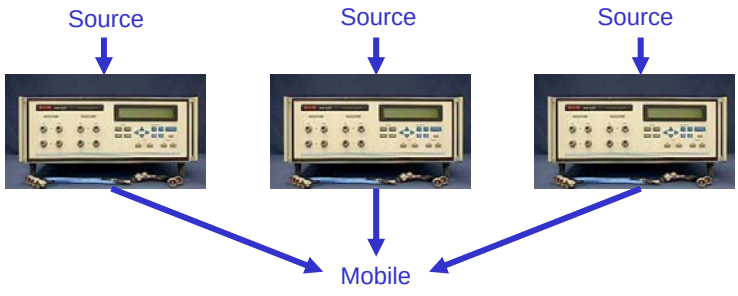
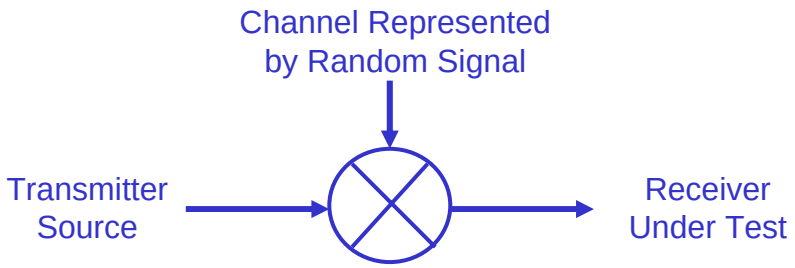
- Emulation carried out by three separate TAS4500 Dual Channel Emulators

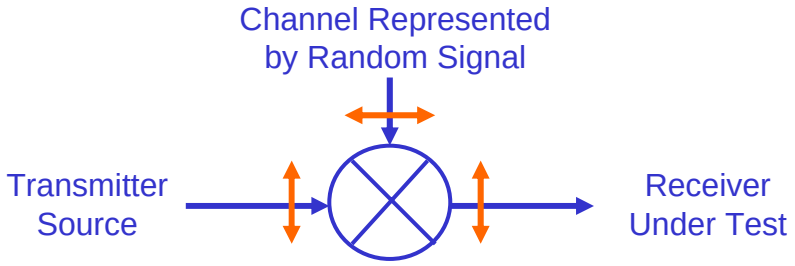


- TAS is now part of Spirent Communications

Channel Emulation

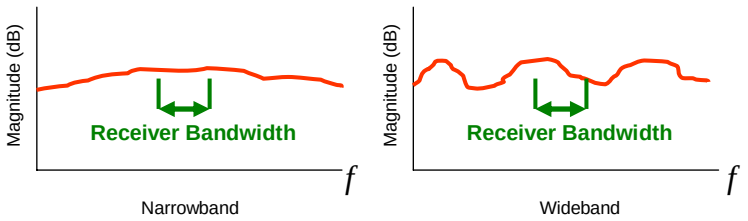


Channel Emulation

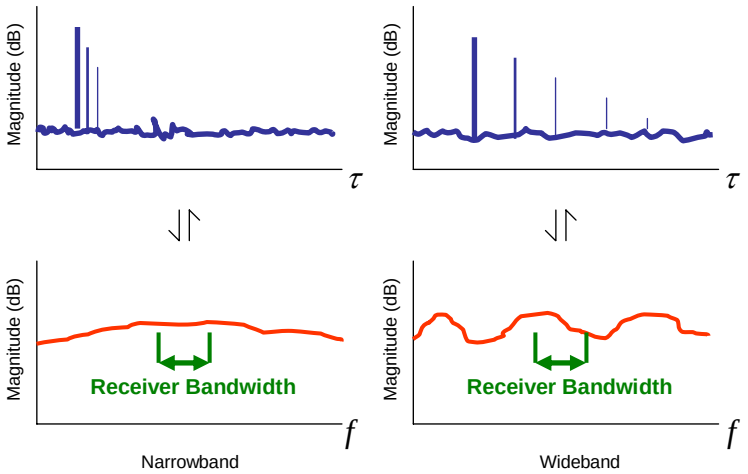


- Required bandwidth must not be limited
- Consideration to be given to narrowband and wideband channels

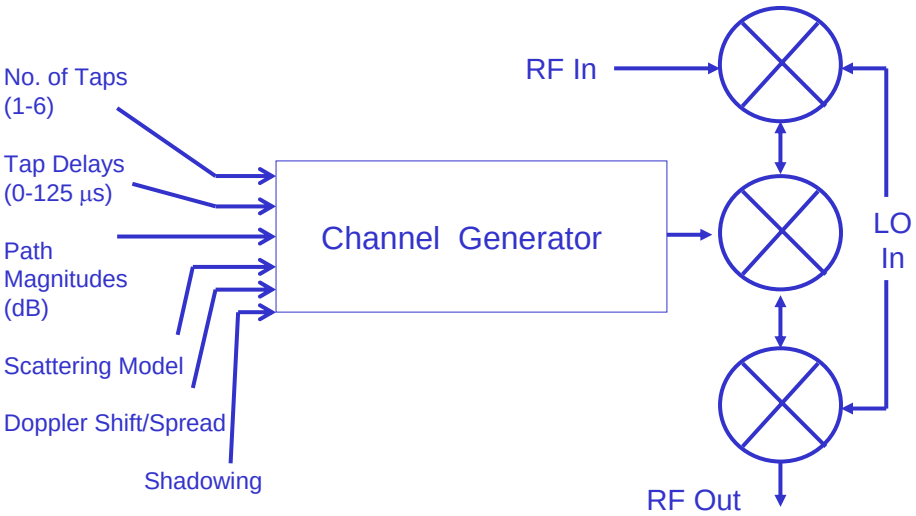
Narrowband vs Wideband



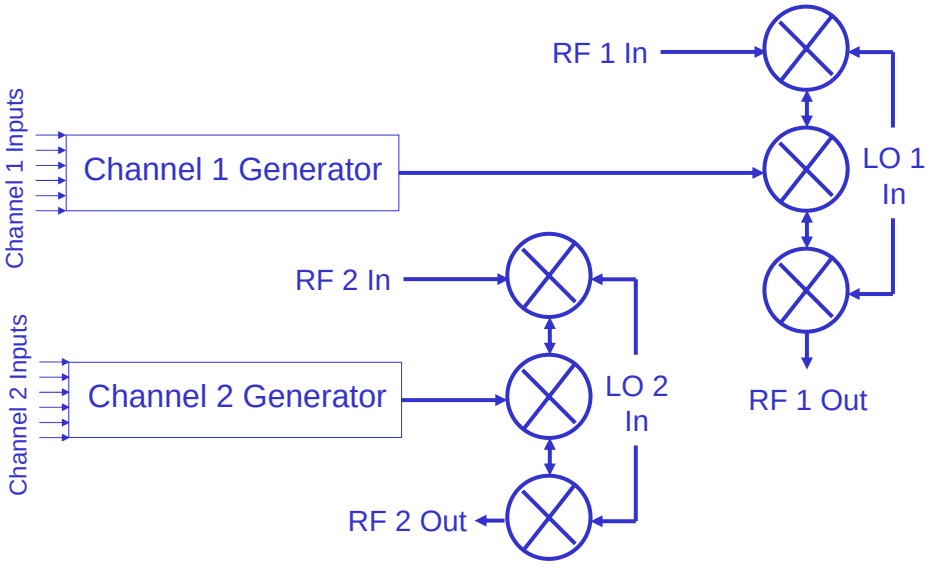
Narrowband vs Wideband



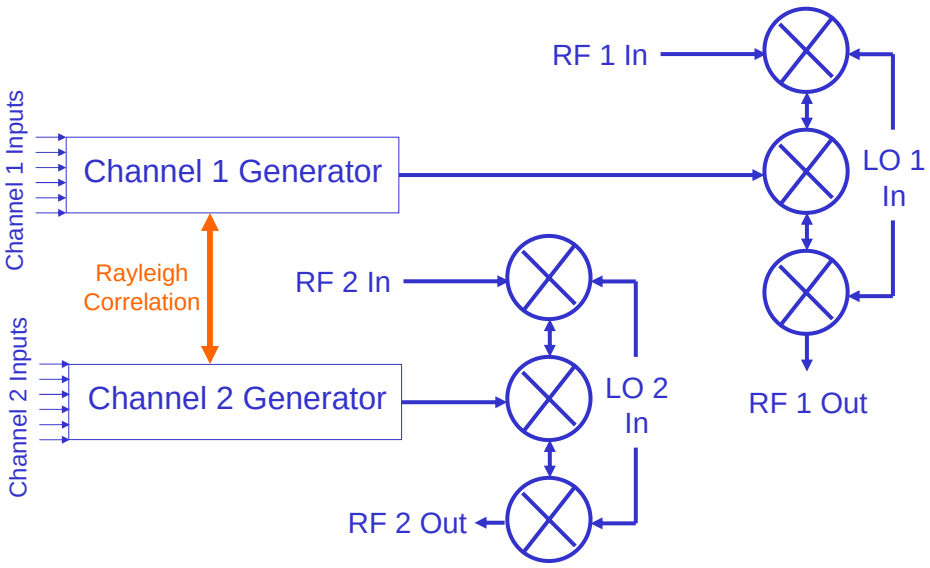
Single TAS4500



Dual Channel

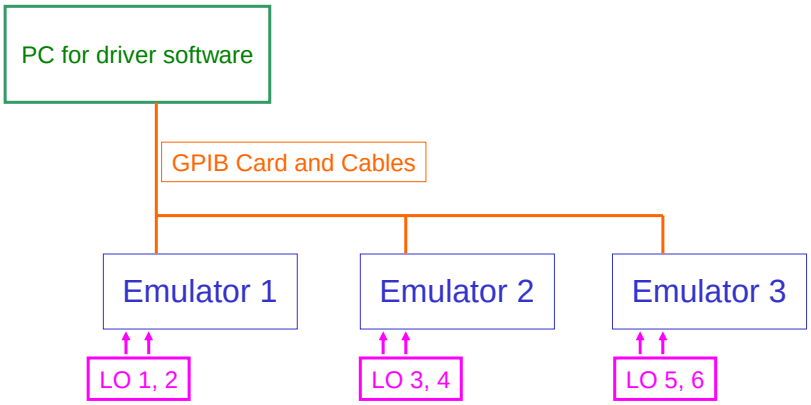


Dual Channel



Operation and setup

The following hardware items will be required in addition to the emulator (plus RF cables, adaptors):



Useful Specifications

Input output specifications:
• RF Range: 25MHz – 3GHz (possibly higher frequencies with down converters)
• Power levels: -30dBm to 5dBm
• RF bandwidth: 26MHz
Capabilities:
• Tap delay resolution, 0.5nS
• Maximum delay resolution, 125μS
• Up to 6 delay paths
• Scattering models: Rayleigh, Rice, Perfect LOS, Nakagami
• Doppler shift ±1000Hz

Summary

• Up to three sets of dual channel links where correlation can be applied between those dual links.

• All three sets can only run independently.

• Easy to use control software, “TasKit”, available and can run on windows XP.

• Synthesised LO source, cables, GPIB and computer are essential other equipment.

• Maximum frequency 3GHz, though possibly higher with down and up conversion.