Introducing the Teradyne FLEX Test System and its differences to J750.
Introducing the *FLEX*
Integrating Teradyne’s Strengths

- Analog instrumentation performance/breadth
- 3 generations of mixed-signal test architectures
- Low cost, CMOS-based design
- IG-XL software ease-of-use
- High instrument density

- Breakthrough in mixed-signal SOC economics
- IG-XL software for ease-of-use, compatibility
- Analog instrumentation breadth and performance
- 4th generation mixed-signal architecture
Universal Slot Test Head

Decentralized System Architecture

Universal Slot Test Head – Scalable Performance

Air Cooled slots for optimal economics
Cable Connect DIB for flexible configuration of signal delivery
Direct Access to the Sync-Link and Background DSP Architecture
IG-XL Vertical Sliced Instrument Software
FLEX is highly configurable

High density single board instruments

- 48 ch 200 MHz digital
- 24 ch 25 V digital, 75 V PMU
- 8 ch octal op amp loop
- 20 ch 30 V / 200 mA dynamic DC
- 6 ch 15 A dynamic DC
- 4 ch 75 V / 2 A dynamic DC
- 4 ch 90 V dynamic DC
- 4 ch 15 MHz, source and capture
- 4 ch VHF AC source & capture
- 2 ch Low jitter 1 GHz clock
- 11 ch 6G Microwave

Future capability

- High density device power supply
- High density digital
- Open Architecture designed instruments

High density instruments and universal slot test head key to field reconfigurability
J750 tester

64 Channels per Board
100 MHz
512/1024 I/O Pins
4 / 16 Meg Per Pin Vector Memory with integrated Scan
Flexible Pattern and Timing Architecture
x32 True Parallel Test

Full suite of instruments:
⇒ SCAN
⇒ Converter Test Option
⇒ Memory Test Option
⇒ High Voltage Drivers
⇒ Mixed Signal Option
<table>
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<th>J750</th>
<th>FLEX</th>
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<tbody>
<tr>
<td><strong>Digital</strong></td>
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</tr>
<tr>
<td>• 64 channels digital</td>
<td>• 48 channels digital</td>
</tr>
<tr>
<td>• Maximum 16 slots (max. 1024 channels)</td>
<td>• Maximum 24 slots (max. 1152 channels)</td>
</tr>
<tr>
<td>• Build-in option</td>
<td>• Build-in option</td>
</tr>
<tr>
<td>• digital signal source/capture (DSIO)</td>
<td>• digital signal source/capture (DSSC)</td>
</tr>
<tr>
<td>• memory test option (MTO)</td>
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<tr>
<td>• scan option</td>
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<tr>
<td><strong>DC and Power</strong></td>
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</tr>
<tr>
<td>• DPS - 8 ch 1A VI</td>
<td>• DC30 - 20 ch 30V/200mA VI, TMS/meter</td>
</tr>
<tr>
<td>• APMU - 64 ch 35V HV digital</td>
<td>• DC75 - 4 ch 75V/2A VI, TMS/meter</td>
</tr>
<tr>
<td></td>
<td>• DC90 - 4 ch 90V/10A pulsed VI, TMS/meter</td>
</tr>
<tr>
<td></td>
<td>• HVD - 24 ch 25V HV digital, 75V PPMU</td>
</tr>
<tr>
<td></td>
<td>• HexVS - 6 ch 6V/15A, merge to 90A</td>
</tr>
<tr>
<td><strong>Mixed Signals Instrument</strong></td>
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</tr>
<tr>
<td>• Mixed Signal Options (MSO)</td>
<td>• Baseband (BBAC)</td>
</tr>
<tr>
<td>• Converter Test Options (CTO)</td>
<td>• Very High Frequency (VHFAC)</td>
</tr>
<tr>
<td></td>
<td>• Microwave RF instrument</td>
</tr>
</tbody>
</table>
## High Speed Digital

### J750

- **Digital channel**
  - Channels per board – 64 channels
  - Maximum Large vector memory – 16 Meg
  - Maximum board per tester – 8 /16
  - Maximum channels per tester – 512/1024
  - Maximum vector rate – 100Mhz

- **Pin Level**
  - vil range - -1 to +6V
  - vih range - 0 to 7.1V
  - vol range - 0 to +5V
  - voh range - 0 to +5V

- **Driver Specification**
  - min pulse width (3V) - 3ns
  - rise/fall time (3V) - 1.9ns
  - Edge accuracy - ± 500 ps

- **Per Pin Measurement Unit**
- **High Voltage pin**
  - 4 pins per board (0 to +16V)

### FLEX

- **Digital channel**
  - Channels per board – 48 channels
  - Maximum Large vector memory – 64 Meg
  - Maximum board per tester – 24
  - Maximum channels per tester – 1152
  - Maximum vector rate – 200Mhz

- **Pin Level**
  - vil range - -1 to +6V
  - vih range - -1 to 6V
  - vol range - -1 to +6V
  - voh range - -1 to +6V

- **Driver Specification**
  - min pulse width (3V) –2.2ns
  - rise/fall time (3V) - 1.5ns
  - Edge accuracy - ± 250 ps

- **Per Pin Measurement Unit**
- **High Voltage pin**
  - 2 pins per board (0 to +20V)
<table>
<thead>
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<tbody>
<tr>
<td><strong>Memory Test Option (MTO)</strong></td>
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</tr>
<tr>
<td>per board</td>
<td>per board</td>
</tr>
<tr>
<td>- 50 MHz execution rate</td>
<td>- 100MHz execution rate</td>
</tr>
<tr>
<td>- 8M 48-bit word Capture Memory</td>
<td>- 24M 64-bit word Capture Memory</td>
</tr>
<tr>
<td>- Algorithmic Pattern Generator</td>
<td>- Algorithmic Pattern Generator</td>
</tr>
<tr>
<td>- 2 X 16-bit address generators (X+Y)</td>
<td>- 4 X 16-bit address generators (X+Y)</td>
</tr>
<tr>
<td>- 2 data generators:</td>
<td>- 4-bit Z address generator</td>
</tr>
<tr>
<td>- (2) 1-bit and (1) 16-bit</td>
<td>- 2 data generators:</td>
</tr>
<tr>
<td>- 2 Scramble RAMs</td>
<td>- (2) 1-bit and (1) 32-bit</td>
</tr>
<tr>
<td>- Topological inversion</td>
<td>- 2 Scramble RAMs</td>
</tr>
<tr>
<td>- 512K x 16 Fail Map Memory</td>
<td>- Topological inversion</td>
</tr>
<tr>
<td></td>
<td>- 1M x 32 Fail Map Memory</td>
</tr>
</tbody>
</table>
### High Speed Digital - Scan

#### J750
- **Scan Option**
  - **Max. number of chains per board** - 16
  - **Chain**: 2 channels (1 Drive/1 Compare)
    - Drive: 0 or 1
    - Compare: L, H. or X
  - **Scan Chain Depth (16M LVM/Board)**
    - 1 Chains/64-channel board: 256M
    - 16 Chains/64-channel board: 16M
  - **Maximum Scan Data Rate**: 50MHz

#### FLEX
- **Scan Options**
  - **Max. number of chains per board** - 24
  - **Chain**: 2 channels (1 Drive/1 Compare)
    - Drive: 0 or 1
    - Compare: L, H. or X
  - **Scan Chain Depth (64M LVM/Board)**
    - 1.5 Chains/48-channel board: 1.54G
    - 24 Chains/48-channel board: 128M
  - **Maximum Scan Data Rate**: 200MHz
High Speed Digital – Power Supply

**J750**

- **Digital Power Supply (DPS)**
  - **Digital Power Supply**
    - 8 Channel V/I per board
    - 0V to 10V 1A per channel
    - Max 4 board per tester
    - Max 32 power supply per tester

**FLEX**

- **DC and Power Supply**
  - **Power Supply - DC30**
    - 20 Channel V/I with Meter per Channel
    - +/- 30V, 100mA or +/-10V, 200mA per channel
    - Functional DC source and measurement
  - **Per-Pin Power Resource DC75**
    - 4 Channel V/I with Meter per Channel
    - +/- 75V, 350mA to +/-6V, 2A per channel
    - Functional DC source and measurement
  - **Per-Pin High Power Resource DC90**
    - 4 Floating V/I with Meter per Channel
    - 25V 20A or 180V 500mA pulsed
    - Functional DC source and measurement
  - **Per-Pin High Power Resource HexVS**
    - 6 High Current Voltage Sources with Meter per Channel
    - 5.5V 15A, Merge able to 90 A @ 3.6V
    - Current Profiling
    - Fast current transition response
## High Speed Digital – Mixed Signal Option

### J750

<table>
<thead>
<tr>
<th>Mixed Signals Instrument</th>
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</thead>
<tbody>
<tr>
<td><strong>Mixed Signal Options (MSO)</strong></td>
</tr>
<tr>
<td>• 4 Sources and 4 Captures per board</td>
</tr>
<tr>
<td>• <strong>Source</strong></td>
</tr>
<tr>
<td>16 Meg source memory</td>
</tr>
<tr>
<td>LF to 20 KHz (SINAD 100dB)</td>
</tr>
<tr>
<td>HF to 23 MHz (SINAD 52 dB)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Capture</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 Meg capture memory</td>
</tr>
<tr>
<td>LF to 20 KHz (SINAD 100dB)</td>
</tr>
<tr>
<td>MF to 6 MHz (SINAD 74 dB)</td>
</tr>
</tbody>
</table>

**Converter Test Option (CTO)**

- 8 instruments per board
- Max. 4 board per tester (32 instr max.)
- **Voltage range** - 0 to 6V and 0 to 3V ranges
- 14 bit accuracy (16 bit resolution)
- 2 Reference voltage sources
- Pattern Generator controlled
- Optimized for Linearity testing of A/Ds

### FLEX

<table>
<thead>
<tr>
<th>Mixed Signals Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boardband AC (BBAC)</strong></td>
</tr>
<tr>
<td>• 2 AWGs and 2 digitizers per board</td>
</tr>
<tr>
<td>• Bandwidth - 15MHz</td>
</tr>
<tr>
<td>• -154 dB/Hz noise floor</td>
</tr>
<tr>
<td>• -120 dB THD, -114 dB SNR</td>
</tr>
<tr>
<td>• PPMU per channel</td>
</tr>
<tr>
<td>• Single-ended or differential</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VHFAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 2 AWGs and 2 digitizers per board</td>
</tr>
<tr>
<td><strong>Sources</strong></td>
</tr>
<tr>
<td>400MS/s Sampling Rate</td>
</tr>
<tr>
<td>8M sample Waveform Memory</td>
</tr>
<tr>
<td>-75dB Harmonics and Spurs @ 1Mhz</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Digitizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>• DC to 32.5 MHz, 14 bits</td>
</tr>
<tr>
<td>• DC to 62.5 MHz, 12 bits</td>
</tr>
<tr>
<td>• Under sampling: DC to 300MHz</td>
</tr>
<tr>
<td>•-75dB Harmonics and Spurs @ 1Mhz</td>
</tr>
<tr>
<td>• 1 Mega-sample capture memory</td>
</tr>
</tbody>
</table>
Software - IG-XL

- Excel Spreadsheet based environment
- GUI Based Code Debug/Development environment
- VBT Code environment

Same IG-XL software environment is used for both J750 and FLEX
## Software – OS platform and IG-XL version

### J750

**IG-XL version**
- Latest release IG-XL 3.40.11

**OS software**
- **Offline**
  - Windows NT
  - Windows 2000 (V3.30.00 or higher)
  - Windows XP (V3.40.09 or higher)
- **Online**
  - Windows NT
  - Windows 2000 (V3.40.00 or higher)
  - Windows XP (V3.40.09 or higher)

**Microsoft office**
- Office 97
- Office 2000 (v3.40.00 or higher)
- Office XP (v3.40.09 or higher)

### FLEX

**IG-XL version**
- Latest release IG-XL 5.00.60

**OS software**
- **Offline**
  - Windows 2000
  - Windows XP
- **Online**
  - Windows 2000
  - Windows XP

**Microsoft office**
- Office 2000
- Office XP
Software – channel map differences

Minor channel map modification due to DIB hardware difference.

FLEX Introduction 2/2004

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Software - IG-XL (FLEX Debug tools)

More extensive debug tools available on FLEX

Pattern Tool II

HRAM Pattern Tool

Test Debug Environment

Test Instance

Test Template

Flow Table

VBA Debug