



High Rate Mass Storage for Instrumentation Applications



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A Word About DSPCon

Technology: *Real-Time Control, Processing and Data Throughput*
• *PCI, VME and VXI Hardware Support, in UNIX, VxWorks and Windows*
• *From DSP Commands to LabWindows/CVI Graphical Control*

Activities: *From Custom Software Routines to Turn-Key Systems, principally based on Pentek hardware; OEM software supplier*

Applications:

• <i>Acoustics</i>	• <i>SONAR</i>
• <i>Vibration</i>	• <i>Communications Test</i>
• <i>SatCom</i>	• <i>Test Process and Control</i>

Support & Training:

- *Over 100 Systems in use, over 500 FTL Software Installations*
- *Provide Development, Application and System Services*

Customer Base:

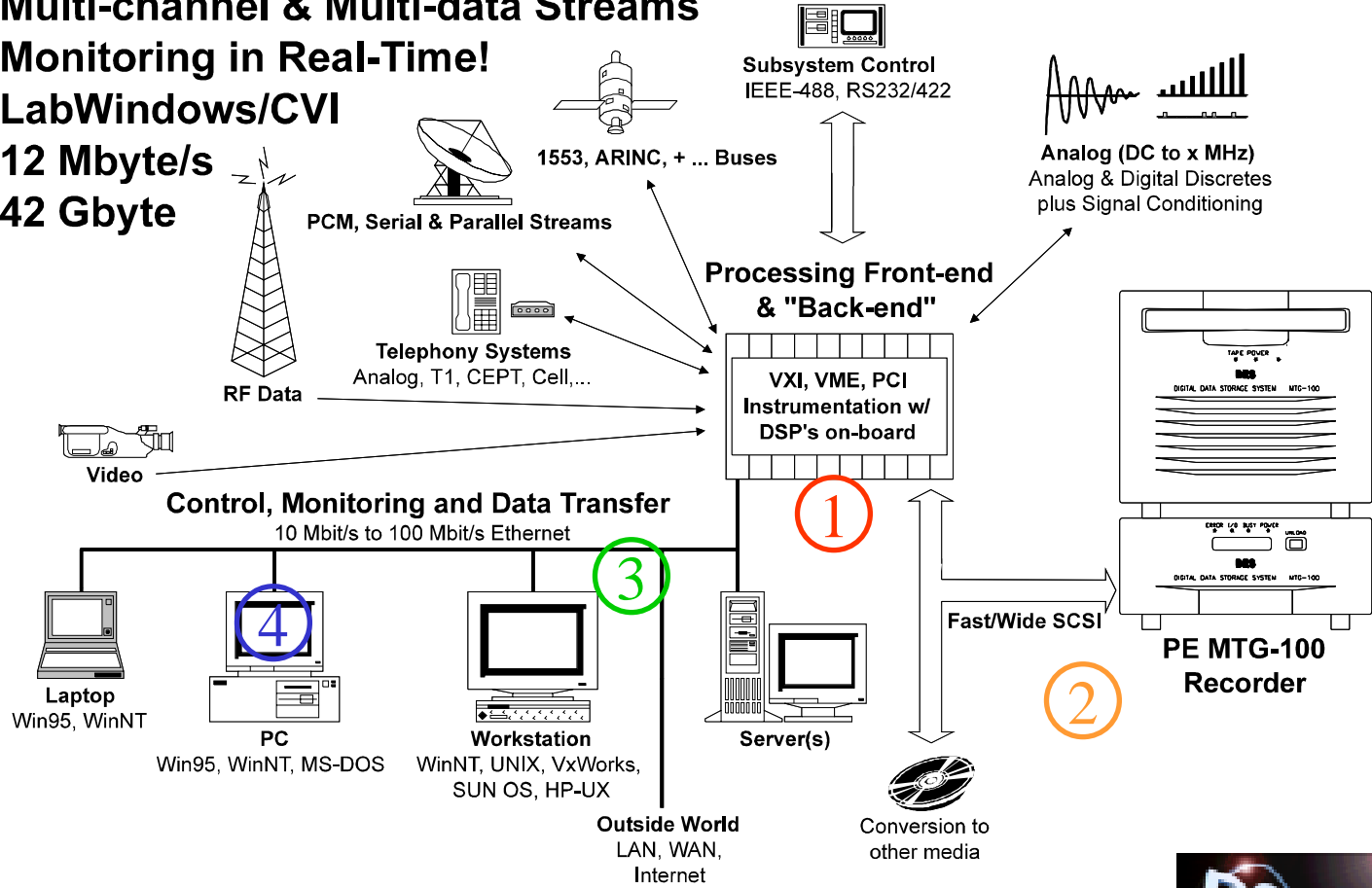
- *Defense and Space Systems*
- *Aerospace*
- *Secret/Classified Installations*
- *Telecommunications*
- *Industrial R&D*

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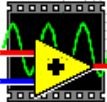
Instrumentation Recording Systems

Real-Time Recording and Replay/Reconstruction with:

- Pre- & Post-Processing, in Real-Time!
- Multi-channel & Multi-data Streams
- Monitoring in Real-Time!
- LabWindows/CVI
- 12 Mbyte/s
- 42 Gbyte

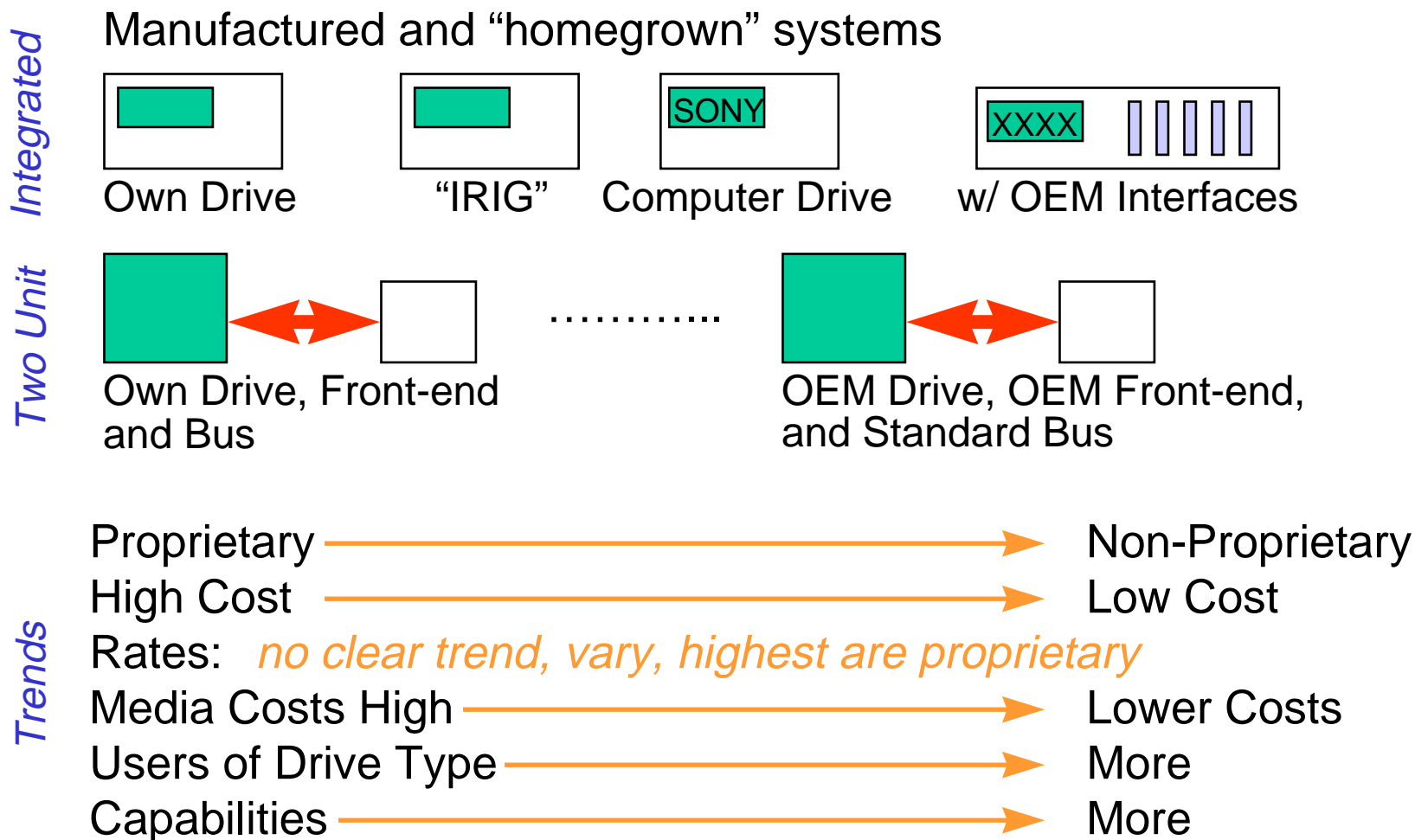


The Recording/Playback System

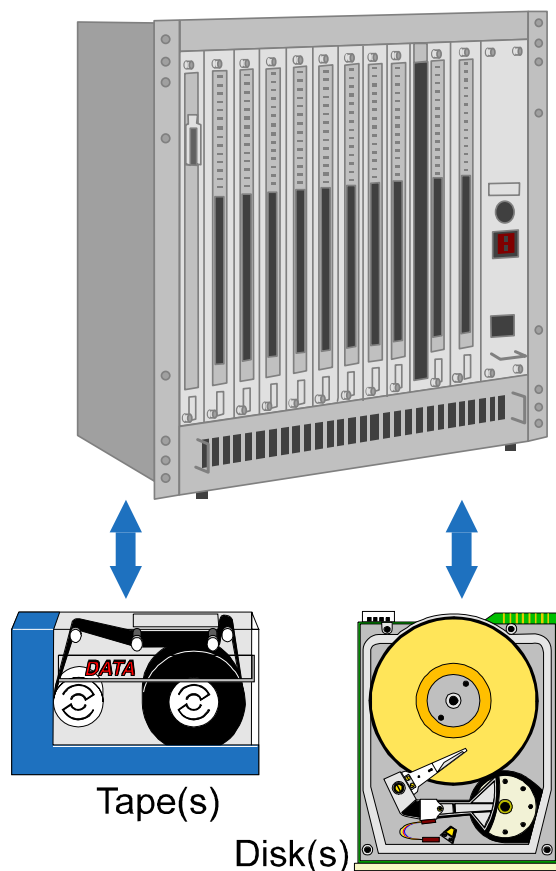
- Front-end (back-end) - VME, VXI &/or PCI
- High Speed Recorder or Disk Drive - SCSI
- DSP “Engine” Software + Ethernet
- High Level GUI Software -
LabWindows/CVI, LabVIEW  LabVIEW®
+ High level Processing Software:
MATLAB, DaDiSP, Waves,...



Traditional Recording Systems



Processing Front- & Back-end

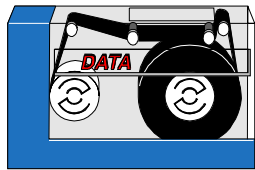


- VMEbus, VXIbus, PCI & PMC
=> wide range of COTS hardware
- Variety of packaging - recorder embedded or external
- Wide range of control interfacing
- Single or multiple DSP's on local buses (MIX, PMC) for speed
- Can re-use front-end as processing back-end during replay.

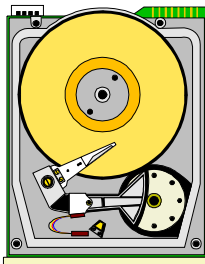
Recorder/Playback Modules



- PE MTG-100, 12MB/s, 42 GB, + library & rugged types
- Fast/Wide SCSI
- Serial/Parallel interfaces supported
- General SCSI device support (up to 21 devices)

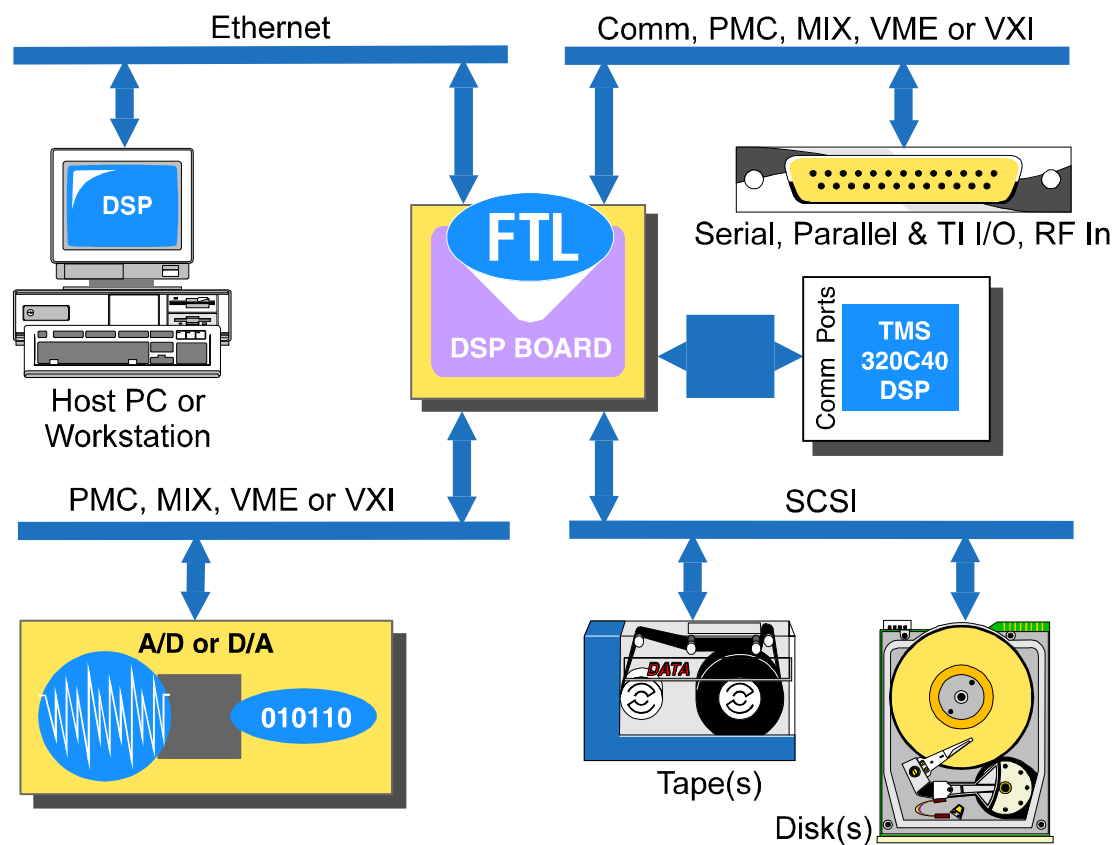


Tape(s)



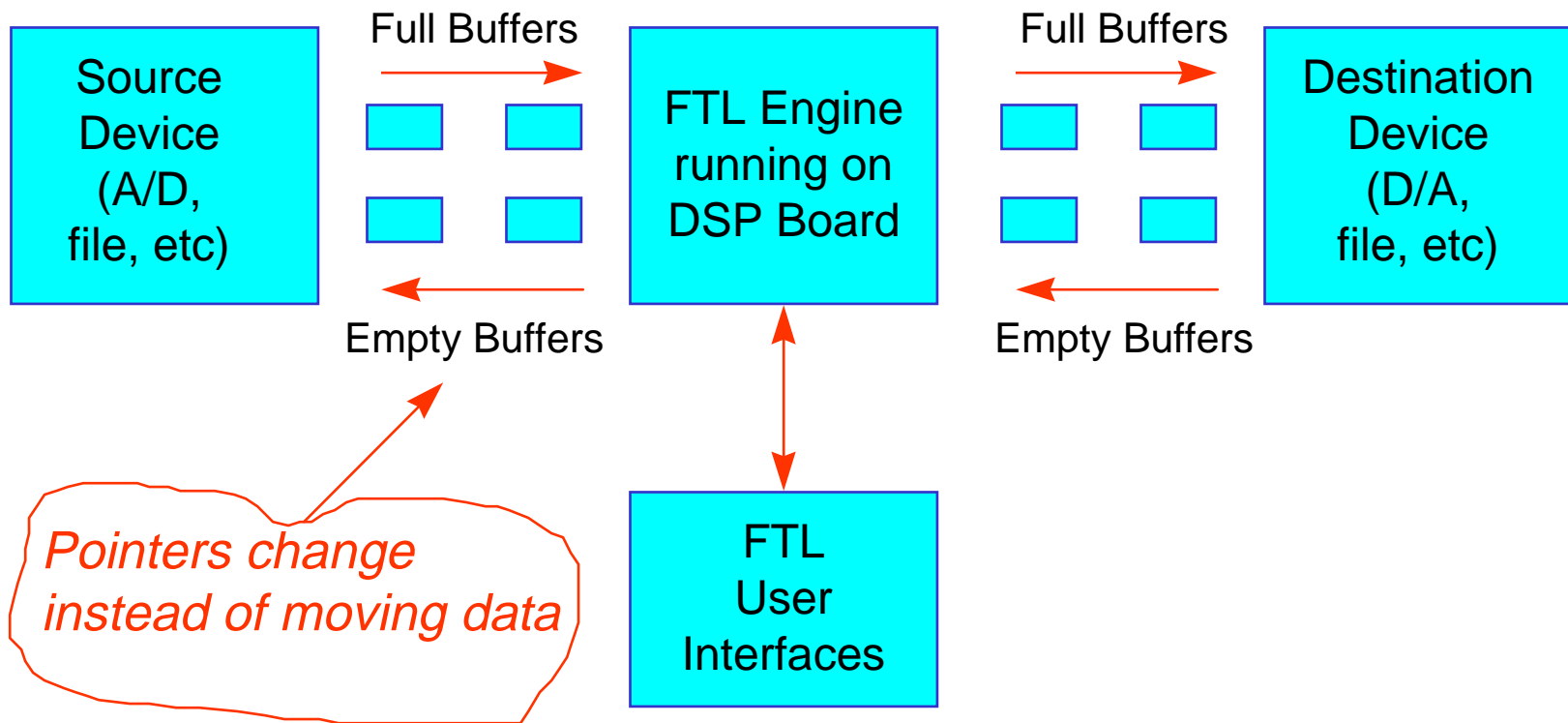
Disk(s)

The DSP Software Engine, FTL



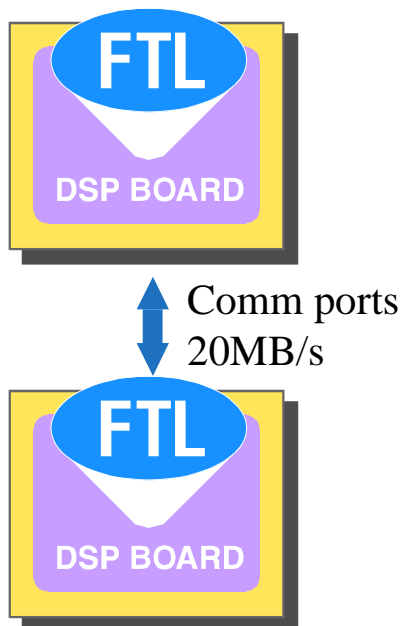
Links signal conditioning to processing and to storage

FTL Streaming Model



Key “Engine” Technologies

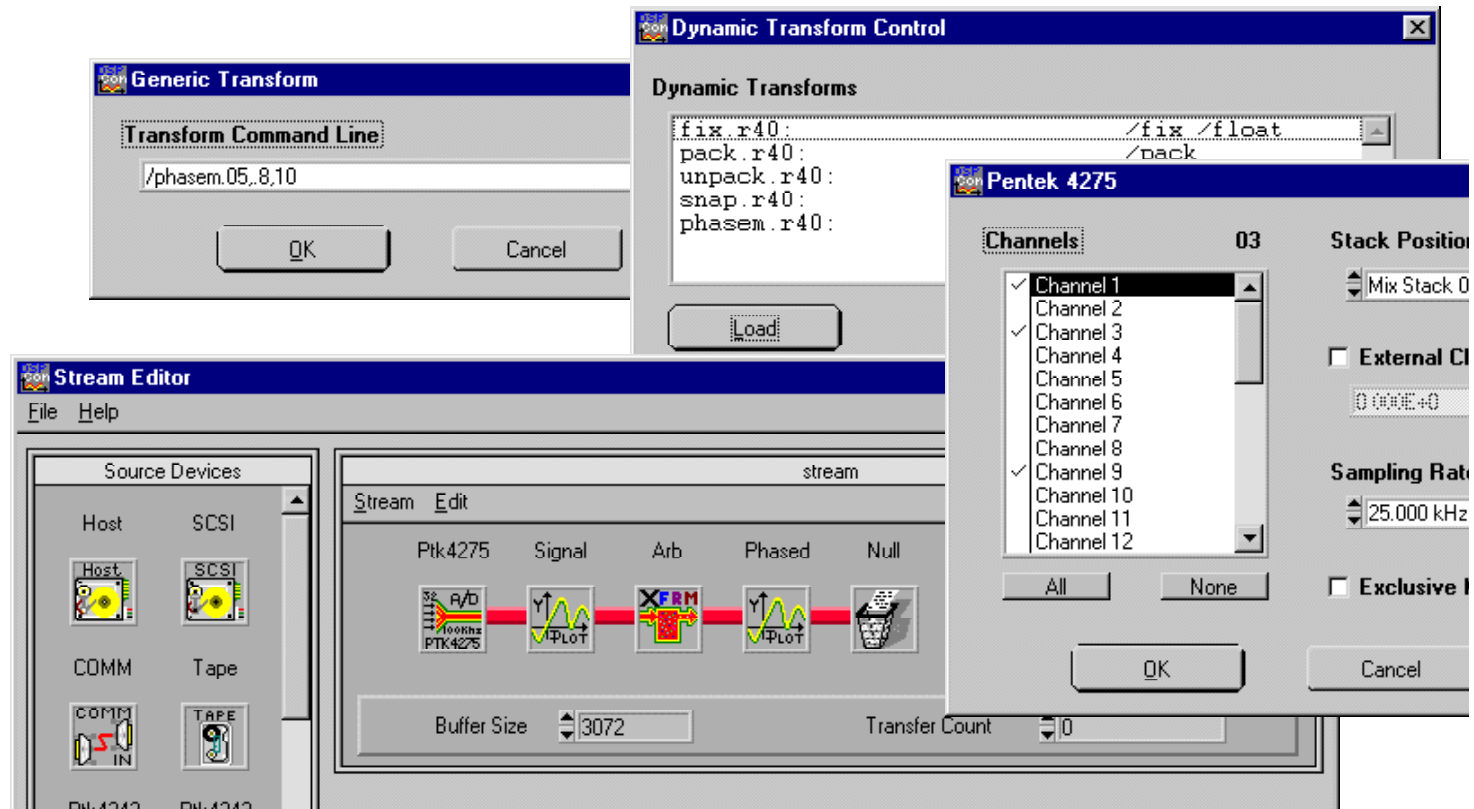
*Think of DSP
as a BNC “T”!*



- Uses DSP’s as data switches and as processors.
- Multi-tasking, multi-processor + distributed processing support.
- User can program in “C”, via interactive shell, API, or GUI.
- Build streams without programming, using built-in drivers and transforms.
- Transforms dynamically loaded.



Dynamic Transforms & Streams



data manipulation in real-time + change in processing in near R-T



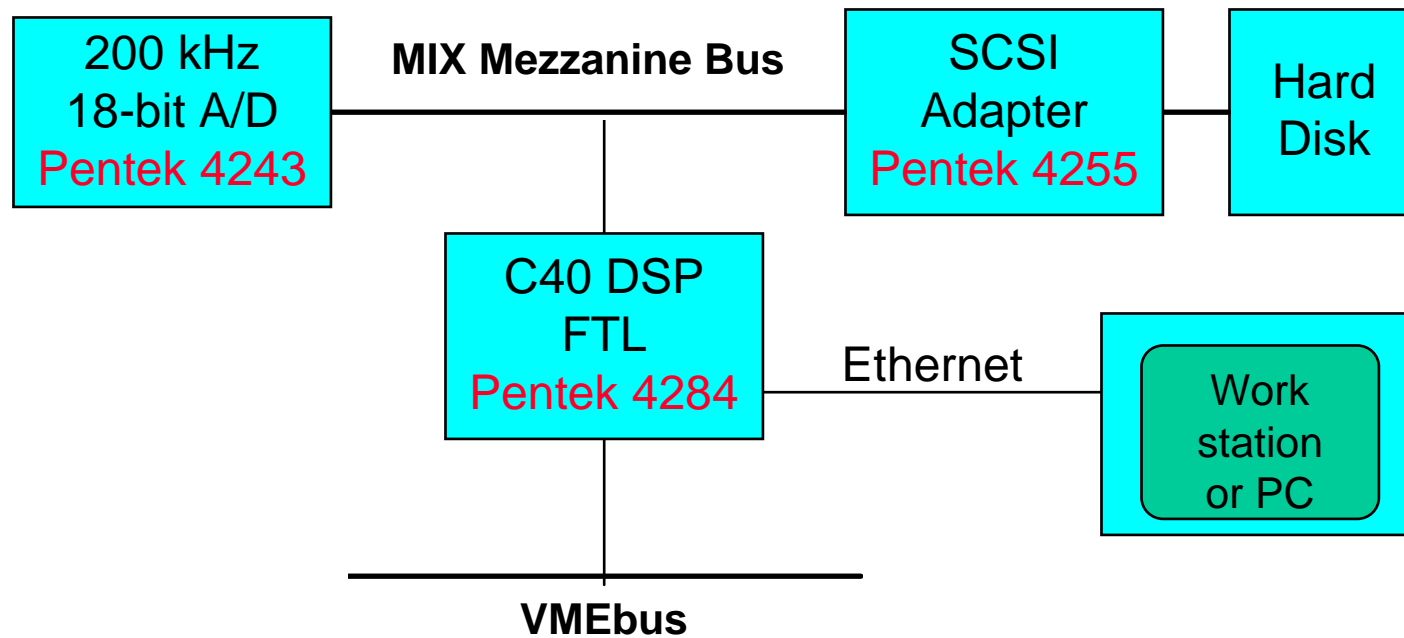
Graphic User Interface (GUI)

The screenshot displays the DSPCon System 2000 GUI with several windows open:

- Terminal Window (/node5/t84b/0):** Shows a shell prompt with commands: scp @stream, scp @comm2, scp @comm1.
- DSPCon System 2000 Help:** A help window with a search bar and a table of dynamic transforms.
- Dynamic Transform Control:** A window with a table of dynamic transforms:

Dynamic Transform	Path
fix.r40:	/fix/flo
pack.r40:	/pack
unpack.r40:	/unpack
snap.r40:	/snap
phasesm.r40:	/phasesm
- Stream Editor:** A window showing a signal flow diagram with blocks for Ptk4275, Signal, Arb, Phased, and Null. It includes a Buffer Size of 3072 and a Transfer Count field.
- Plot Window:** A window showing a plot of Normalized Magnitude versus Seconds. The plot displays a complex waveform with a red sinusoidal envelope overlaid. The x-axis ranges from 0.000 to 0.020 seconds, and the y-axis ranges from -1.000 to 1.000. Buttons for 'Time Series', 'CONFIG', and 'SELECT' are visible at the bottom.
- COMM:** A window for channel configuration with fields for Port Number (Port 0) and Channel Identifier (Channel 0).
- Pentek 4243:** A window for channel configuration with checkboxes for Channel A and Channel B, a Stack Position field (Mix Stack 0), a Sampling Rate field (44.100E+3), and a Filter Cutoff field (20.000E+3).

Application Example





A Word About Performance

- With the PE MTG-100: 12 Mbyte/sec cont.
- With Fast/Wide AV Hard Disks: 6-7 MB/s
- With 8 bit SCSI Hard Disks: 3-4 MB/s
(with drivers designed to reduce searches)
- With typical DLT's, 8 mm's and DAT's: up to maximum rate of drive.
- Data buses generally are good for 20MB/s



A Word About the Future

- New drives and recorders can be rapidly integrated, as can new signal interfaces.
- ATM can be an alternative to 100BaseT4, for control and real-time data transfer.
- LabVIEW is coming of age, now hosts better processing, and soon better plotting.
- New Recorders are on the way from PE.
- New, compact, front-end is on the way.

A New Front-end

“Network Adapter”

From Drive & Signals to Ethernet, ATM,...

