WHICH CONTROLLER?

INTRODUCTION

Today, recording video onto disks is rapidly changing the way programmes are managed, made and played out to air. Large capacity disk stores are now low priced and cost-effective but they need some form of control to be any use. Unlike the VTRs that also continue in use, most video disk stores do not come with a control panel and, as with VTRs themselves, there is a continuing wide requirement for local control access to all types of stored video. In many cases the control is taken care of by items such as automation systems, asset management systems or nonlinear editing systems. However, many of these 'controllers' are costly or dedicated to another application, and none give the hands-on control needed for instant action at the sharp-end of live broadcasting or cover the many other needs for access to stored material.

The combination of a video disk store with a control panel offering the ergonomics needed for quick simple operations or live programme requirements, can create a highly effective solution at a low price. It extends the benefits of disk storage right into the heart of production with control by buttons, T-bars and jog/shuttle wheels rather than keyboards, menus and mice.

Video disk storage technology is now highly developed and there are several types of storage, Digital Disk Recorders (DDR), video servers and still VTRs. All these three storage categories work in different ways and have specific advantages and features. In particular video servers that have large-scale multi-user capability and the ability for the real-time playing of clips in random order are the most different – furthest from the established VTR norm. So it is not surprising that there are also several different types of control protocol used to drive the different types of storage. Some are industry standards and there are several manufacturer-native protocols. It is important to use not only the right storage system but also the right controller for the required job. Some guidelines for choice of controllers are given here.

TYPES OF CONTROL

There are two fundamentally different ways of controlling video recorders that closely relate to the way they record. For convenience we refer to them here as Timecode-based and Clip-based.

- **Timecode-based**

For tape-based (typically a VTR) or linear recorders (typically a DDR) control is always timecode-based. That is to say everything relates to timecode so any item can be found, cued and played by referring to its timecode. This extends

to slow motion control as well. Timecode always shows the exact position of the recording or replay. Remembering an items' timecode start and end points, and storing these as a cue – which could be a number or name, add further control.

• Clip-based
Video servers record video as clips – groups of frames that may have no reference to timecode but are given some form of reference by the server so it can locate the clip when required by one of its clients (users). From the outside they do appear to have TC. Some control protocols include a timecode track while others are frame-based identifying the frames of a clip by frame numbers, say from 0000 to 9999. Exactly how frame are identified varies between products.

A clip can be thought of as a single tape being loaded into a video server – the tape has a name and on the tape there is timecode which, in turn, could have cue points stored.

TYPES OF EQUIPMENT

It is not always obvious as to which type of control works with what equipment. This is because some video server manufacturers have put more control and management into their products than others, so some can look like VTRs to users.

• DDRs
Not all disk-based recorders are clip-based. Digital Disk Recorders (DDRs) are generally designed to act as VTR replacements. These include a mechanism to allow them to be controlled like a VTR and so their control can be Timecode-based and a VTR controller can be used.

• VTRs
With VTRs there is no question: they are always timecode-based.

• Video Servers
Generally, video servers can be controlled directly by timecode by having a VTR protocol built in, so they can easily interface with existing legacy products, such as editors. Their clips exist as collections of frames and their image and audio data may be scattered around the disk storage as a collection of clips which, unlike the linear DDRs and VTRs, servers can replay back-to-back regardless of where they are stored. This type of random access replay is not catered for in VTR controllers.

The video server itself creates labels, clip IDs that may well be a string of characters, to identify the stored clip data, but these labels are typically not very user-friendly. Automation systems and the better server controllers (eg actiV panels) often enable the use of meaningful clip titles, for example 'Winner-2003', that link to the clip IDs, making the server easier to use. The automation/controller can also link this information to larger layers of metadata

that may be in other areas, such as media asset management, to provide far more information about the stored video.

In essence, servers have a mechanism to create 'machine' labels – clip IDs. Automation systems/controllers can give clips a meaningful string of characters, command back-to-back replays as well as the usual VTR-like operations. They may also store, or provide links to, large amounts of metadata.

PROTOCOLS

There are a number of control protocols used in the industry for handling either timecode-based or clip-based systems.

Timecode-based

There is only one widely used protocol variously referred to as

Sony 9-pin
Sony P2
Sony VTR protocol
Sony RS422
Sony Serial
BVW75

Clip-based

There are many protocols used and it is necessary for the right protocol to be used with the any one media recorder. In nearly all instances one of a number of established industry standards are used such as:

Industry standard
VDCP (Video Disk Control Protocol)
Odetics (an extension of Sony protocol)

Manufacturers' native protocols
Profile
MAV555
Quantel
And more….

HI TECH CONTROLLERS

Hi Tech Systems offers a range of controllers for VTRs, DDRs and Video servers and it is important to choose the right one for any required application.

VTRs and DDRs

The HT800 series offers timecode-based control for VTRs, DDRs and some aspects of some servers that offer Sony 9-pin (timecode-based control) control. The HT800 offers from 2, 4 or 8-channels of control – according to

requirements. Note that many DDRs are two-channel and are usually then able to both record and play at the same time. This would require two channels to fully remote control it – one for the record side and one for the playback side.

If there is a requirement for slow motion, then the 'S' version does the job (eg HT884S). This adds a T-bar to the control panel offering direct live 'hands-on' control of slo-mo replays. and specially designed quick cueing features – that help fast operation.

The actiV Filer range includes VTR protocol and can assign different protocols to its different control ports. This means you can handle both servers and VTRs/DDRs at the same time and has many advantages in that one actiV filer can, for example, control both VTR replay and server record for playing in material, also playout to tape, etc. It also acts as a cuts-only editor.

Video Servers

As video servers are clip-based the natural choice would be for a clip-based controller. That is provided by Hi Tech's actiV Filer. However, if the server can be controlled with VTR protocol, then an HT800 series controller can be used. This type of control may miss out on some of the other server facilities (see below)

For sports applications, ie with slow motion requirement, this part of the control is always primarily timecode-based. Typically there is one continuous recording of a live event and, at the same time, marking of many 'in' and 'out' cue points that define 'clips', and then playouts, of that recording. However if back-to-back clip playout is required then a continuous replay is needed. In this case clip-based control is required to access the special server commands that pre-load the next item so the whole plays without any discontinuities – even while the main recording is being played.

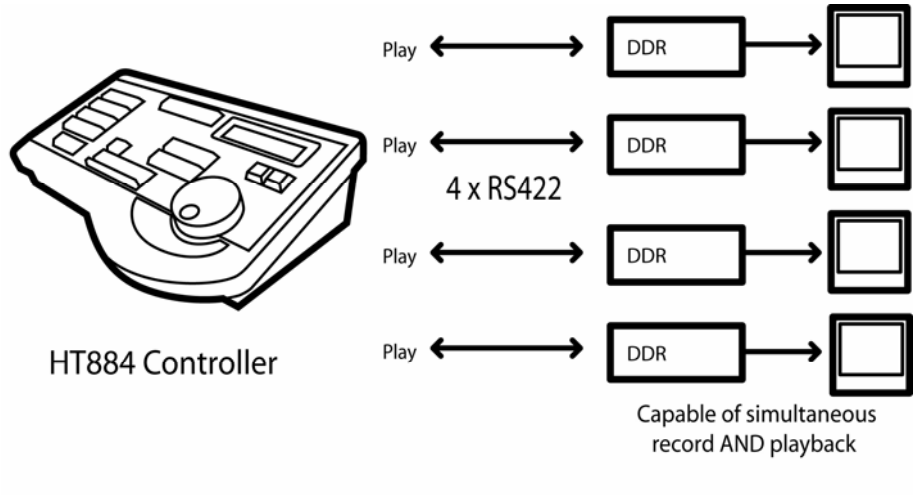
The Hi Tech actiV Filers always include all commonly used server and VTR control protocols. They can also assign different types of control to their different control ports, so they may control both slow motion and clip-based server facilities from the same panel.

Number of Channels

Hi Tech VTR and server controllers are offered in a range of configurations to fit requirements. As mentioned above, there is a choice between types: the actiV Controllers, for server and VTR control, and the HT 800 series for DDRs and VTRs. There are also the HT700, HT112 and the HT100 series of smaller VTR controllers.

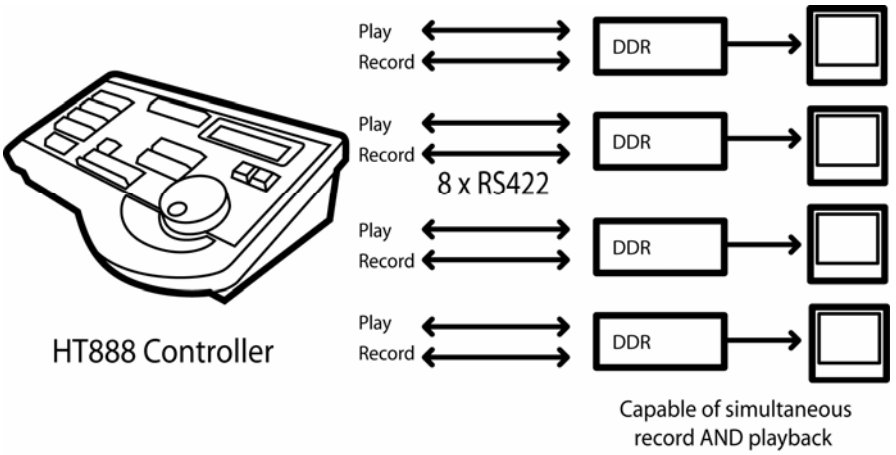
The number of channels needed for server control is defined by the number of control ports available on the server. However, the control channels needed for VTRs, DDRs can be a little confusing because of the differences between VTRs and VTR-like recorders.

The universal VTR control, the Sony 9-pin port, can be used to control a VTR for all its play and record operations. It knows that the VTR cannot record and play at the same time and so can switch between play and record, but not do both at once. But a single-channel DDR may well be able to both record and replay at the same time and so has two Sony 9-pin ports: one for play and one for record. To be able to use both of these at once, which is often very useful, two VTR control channels are needed. So a 2-channel HT882 could be used to fully control a Sony DSR DR-1000 with access to simultaneous play and record.



Example of 4 channel DDR control with control over PLAY channels

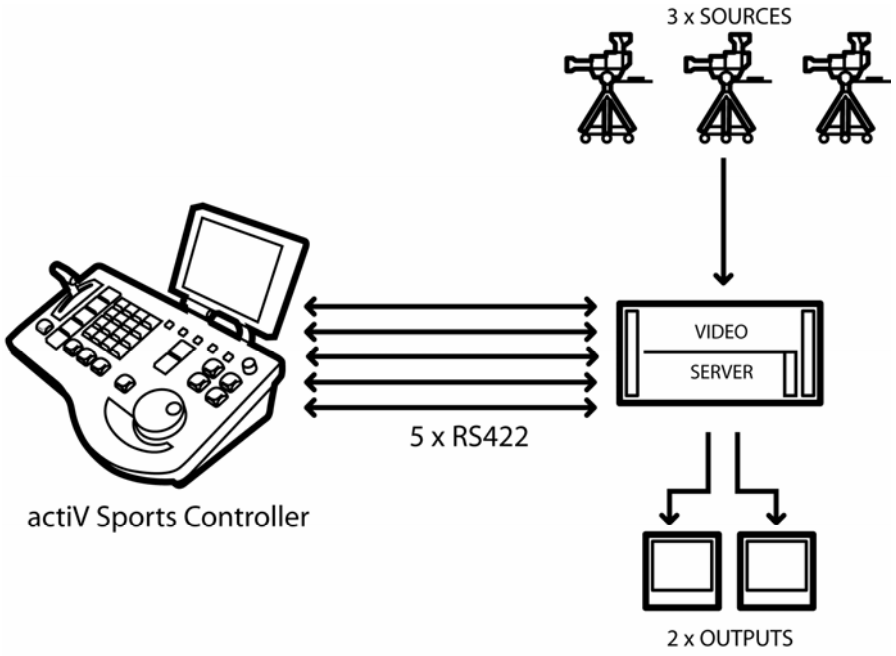
The HT800 series is available in 2, 4, or 8 channel versions (HT882, 884 and 888). The HT888 controller can fully control four DSR DR-1000s, or eight VTRs, or combinations of both.



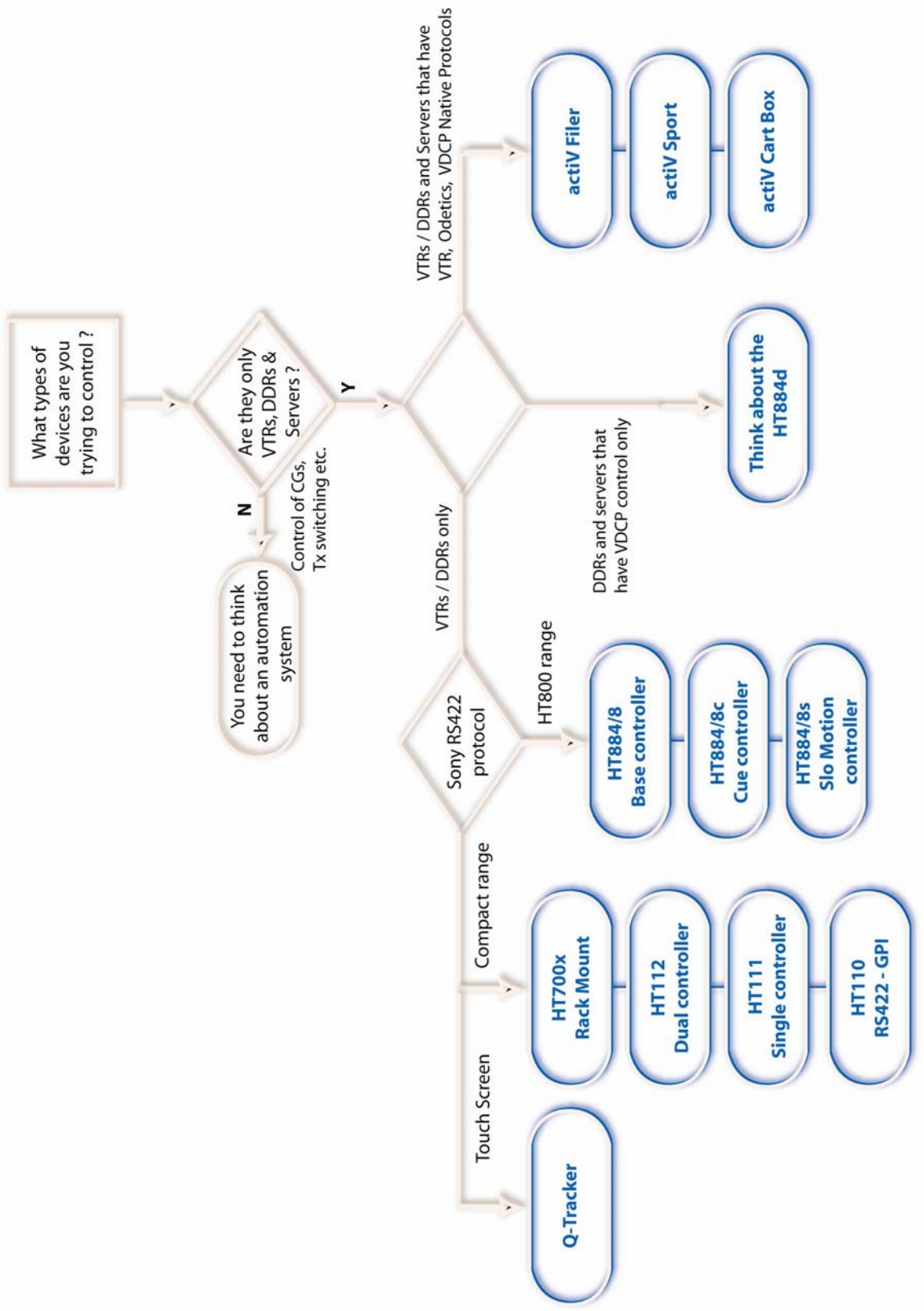
Example of 8 channel DDR control with
control over PLAY and RECORD channels

In some cases it may be possible to economise or simplify control channels. For example, in a sports event like football, the recorder is set to record the event from beginning to end. On the play side clips are selected, cued and replayed while the recording continues. Thus a two-channel controller could run a 4-

channel server (2 record inputs and 2 playback outputs) such as GVGs iVTR or Doremi's MCS, by initiating the recording on the recorder's own control panel and running the play side from an HT882s (sports, with slow-motion). It may well be that this is not very convenient, or even that the servers have been supplied without the front control panels, in which case, a 4-channel controller is needed.



Example of 5 channel server control with control over ALL channels


What types of devices are you trying to control ?
Are they only VTRs, DDRs & Servers ?
N
Y
You need to think about an automation system
Control of CGs, Tx switching etc.
VTRs / DDRs and Servers that have VTR, Odetics, VDCP Native Protocols
actiV Filer
actiV Sport
actiV Cart Box
Think about the HT884d
DDRs and servers that have VDCP control only
VTRs / DDRs only
Sony RS422 protocol
HT800 range
HT884/8 Base controller
HT884/8c Cue controller
HT884/8s Slo Motion controller
Compact range
HT700x Rack Mount
HT112 Dual controller
HT111 Single controller
HT110 RS422 - GPI
Touch Screen
Q-Tracker