

4:2:2 Component Digital VTR

# DVR-1000/DVPC-1000

4:2:2  
Component Digital



Sony  
Broadcast

SONY®

*The DVR-1000/DVPC-1000 is the world's first component digital video cassette recorder. Developed through Sony's accumulated expertise in professional video recording technology, this digital VTR system meets the format parameters defined in the SMPTE D-1 and EBU Tech 3252 formats. The DVR-1000/DVPC-1000 offers the highest possible picture and audio quality in both the 525/60 and 625/50 TV systems. The digitally recorded signal includes powerful error correction and concealment, which assure a remarkably high degree of transparency in multi-generation recording.*

*The DVR-1000/DVPC-1000 is also engineered with maximum interface flexibility. Video interfaces are available in analog R/G/B, Y/R-Y/B-Y, Betacam™ component, or digital parallel/serial. The four digital audio channels are each equipped with both analog and AES/EBU compatible I/O ports. Moreover, the system can be easily linked to any Sony composite digital VTR for digital format conversion.*

*The DVR-1000/DVPC-1000, in combination with the DVS-8000C, DME-9000 and BVE-9000, brings unlimited potentials and power to creative video production.*

## **MAIN FEATURES**

### **Worldwide Standard**

The DVR-1000/DVPC-1000 conforms to the SMPTE D-1 and EBU 3252 formats, offering the ability to handle both the 525/60 and 625/50 television standards from one single machine. This allows the DVR-1000/DVPC-1000 to be used for video production in both 525/60 and 625/50 environments as well as to be used for film-to-tape transfers where worldwide distribution of tapes is required. The power supply is also switch selectable between 100 to 120V and 220 to 240V for worldwide operation.

### **High Quality Video and Audio**

#### **Outstanding Multi-Generation Capability**

The DVR-1000/DVPC-1000 is equipped with powerful error correction and concealment, offering multi-generation capability inconceivable with conventional analog VTRs. First generation video and audio quality is offered throughout several dozen generations of dubbing when using the digital interfaces. This feature provides much wider operational flexibility by eliminating dubbing limitations and thereby, allows more efficient and complex multi-layering and editing.

#### **High Quality Video**

The DVR-1000/DVPC-1000 incorporates all of the outstanding advantages of the D-1 format. Video bandwidth is 5.75MHz for the luminance signal and 2.75MHz for both of the chrominance signals while a signal-to-noise ratio of 56dB is realized. The superb characteristics of the component video signal in addition to these wide bandwidths realized by the adoption of

digital signal processing makes the DVR-1000/DVPC-1000 most suitable for sophisticated keying, matting, and film-to-tape transfers. Freedom from color framing problems in the component video facilitates editing and effects. Component video is also ideal for color correction and other picture processing.

In addition to the outstanding video parameter specifications, the DVR-1000/DVPC-1000 is also engineered to provide broadcast quality playback pictures within the range of  $\pm 1/4$  times normal speed including STILL (field or frame is possible), and recognizable color pictures at up to  $\pm 40$  times normal speed.

#### **Four Digital Audio Channels**

The DVR-1000/DVPC-1000 is equipped with four independently editable digital audio channels. Each channel provides a frequency response of 20Hz to 20kHz and a dynamic range in excess of 90dB. The four audio channels are double recorded to protect the recorded signals virtually from any amount of random or burst errors.

The DVR-1000/DVPC-1000 provides the user with the option of combining the four channels in pairs; or using four independent I/O ports, or one stereo pair plus two independent channels. In addition, D-sub 15-pin I/O ports are equipped to handle all four digital audio channels on one single cable. Internal signal routing is possible within the unit to dub channel-to-channel in any combination without external connections. The DVR-1000/DVPC-1000 is also provided with an advanced output, independent of the main outputs. This allows pre-read editing functions such as fade-in/fade-out, sound-on-sound, etc. to be performed with only one VTR.

## Easy Operation

## Multi-cassette Operation

The DVR-1000/DVPC-1000 incorporates cassette based operation, which ensures easier tape handling and better tape protection than that of open reel VTRs. The cassette type conforms to the standard specified in the SMPTE D-1 format. The DVR-1000 is designed to accept both M-size and L-size cassettes. Maximum recording and playback time is 34 minutes for M-size cassettes, and 94 minutes for L-size cassettes.

Model	Size	Thickness	Recording/Playback Time	Tape Length
DCM-200	M	16μm	12 min.	225m
DCM-400	M	16μm	22 min.	400m
DCM-600	M	16μm	34 min.	604m
DCL-1300	L	16μm	76 min.	1330m
DCL-1600	L	13μm	94 min.	1640m



## Wide Electroluminescent (EL) Panel

The sophisticated design of the DVR-1000/DVPC-1000 control panel provides maximum operational ease. The control panel adopts a large EL display (640 × 200 dots) which keeps the operator informed of all data required for operation of the DVR-1000/DVPC-1000. Data is



logically grouped into 12 main menus, each of which may be immediately accessed and displayed on the EL panel using the 12 menu keys. Parameter setting of each menu is also easy using the 12 function keys. The main features of the display area are:

- All of the items required for the operation of the VTR categorized in 12 main easily accessible menus.
- It is possible to monitor most of the necessary information during recording and playback.
- Audio level information is provided within the display.
- Mode settings and controls can be accessed from the control panel.
- Sophisticated self-diagnostics and error indications.
- Graphic cassette indication provides information on the cassette size, running direction, and remaining tape amount.

### User Preset Function

The DVR-1000/DVPC-1000 allows the storage and recall of up to three user selected setting conditions. The registered settings can easily be recalled with minimum keystrokes.

### Built-in Editing Facility

The DVR-1000's built-in editing facility allows the control of two machines via simple connections using the RS-422 port. All data necessary for editing is displayed on the EL panel and edit data entry can be executed via the 20-key numeric keypad.

### Built-in Time Code Reader/Generator/Character Generator

The DVR-1000/DVPC-1000 has a built-in time code generator which offers free-run/rec-run modes as well as drop frame/non-drop frame time code generation. Time codes may be slaved to an external generator when required. In addition to LTC, this time code generator generates ASTC—Audio Sector Time Code. ASTC is a digital time code recorded in spare data bits in the digital audio sectors on the helical tracks. Because ASTC can be read even at slow speeds and still frame, it provides the same capability as provided by VITC on 1-inch Type C recorders, but without sacrificing any vertical interval lines.

The internal reader reads both LTC and ASTC which can be displayed on the DVR-1000's EL panel. In addition, the time code can be inserted into the DVPC-1000's monitor video output by the built-in character generator.

### Remote Control

Equipped with three RS-422 ports, one DVR-1000/DVPC-1000 can control or be controlled by up to two other DVR-1000/DVPC-1000s. Remote control via the Sony BVE-910 or BVE-9000 Editing Control Units is also possible.

## Digital Recording/Processing

Digital recording techniques virtually eliminate video and audio signal degradation which is inherent in analog recording.

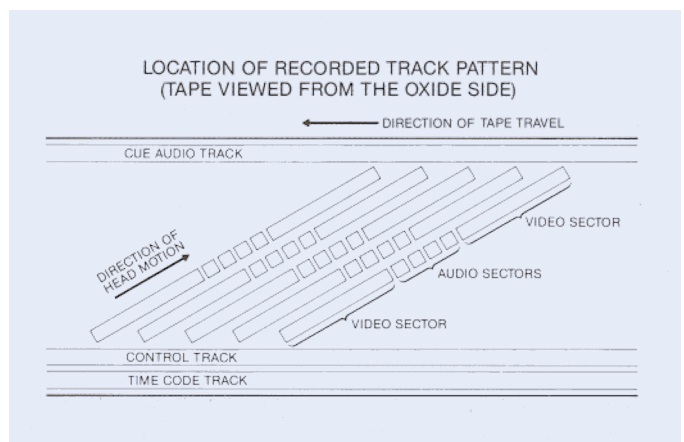
The two dimensional Reed-Solomon error detection and correction capability of the DVR-1000/DVPC-1000 provides ultimate transparency of the reproduced signal in playback. For extreme situations where the raw error rate may exceed the error correction capability such as long dropouts, head clogging, and loss of data due to cross tracking in stunt modes, the DVR-1000/DVPC-1000's error concealment system will activate to provide the most satisfactory picture with the data available. Thus, transparent quality is maintained throughout an unlimited number of dubs when using either the digital parallel or serial I/O ports.

Digital recording also allows the use of a wider video bandwidth which is proportional to the sampling frequency. The high sampling frequencies of the DVR-1000/DVPC-1000 provide very detailed chroma and luminance information, giving most realistic depth to pictures.

The DVR-1000/DVPC-1000 makes maximum use of the advantages inherent in digital recording technology.

## Tape Format

The cue audio, control, and time code tracks are located in the longitudinal direction and written by the stationary head. The digital audio and video tracks, located in the helical direction, are written by the drum scanner heads. The audio track consists of four sectors and is located at the center of the tape pattern as shown in the figure. Each sector contains one channel of digital audio. The video tracks are recorded on both sides of the audio tracks. 20 video sectors configure one field for 525/60 systems, and 24 sectors configure one field for 625/50 systems. Audio sector time code (ASTC) is recorded in spare data in the audio sectors, and can be read at still and slow speeds when the longitudinal time code cannot be reliably read.



## Error Rate Monitoring

The DVR-1000/DVPC-1000 offers "Error Rate Monitoring" during the normal playback and confidence playback modes. This feature can be effectively used for evaluation of the recorded video/audio signals while or after they are recorded on the tape. Error data is accessed via the RS-232C port on the DVR-1000, and can be stored in external devices such as microcomputers in forms determined by the applied software. This eliminates the need for watching picture monitors during simple dubbing procedures and also allows more sophisticated tape management using the data stored in the external device.

## Enhanced Editing Functions

The DVR-1000/DVPC-1000 incorporates new enhanced editing functions, further extending its power in video production and film-to-tape transfers. Functions such as the following are available and can easily be accessed in the AUTO EDIT mode.

### Parallel Operation

Parallel playback or editing operation of two DVR-1000/DVPC-1000s connected via an RS-422 cable is possible. In playback, the two DVR-1000/DVPC-1000s will run and playback the loaded tapes simultaneously. In editing, the edit source will be assembled or inserted to the tapes in each VTR. This mode also allows the construction of a 4:2:2:4 or 4 × 4 system when the appropriate decoder and encoder are used.

### Sequence Operation

Sequential playback of two DVR-1000/DVPC-1000s is performed automatically. This mode extends the playback time to 188 minutes with two 94 minute tapes, allowing more efficient mastering of high quality video packages where long durations are required.

### Graphic Operation

This mode extremely simplifies the recording of graphics by the DVR-1000/DVPC-1000. After each edit, the OUT point of the edit is automatically registered as the IN point of the next edit, allowing consecutive editing of images created in graphic workstations or disk recorders.

### Film-525 Operation

This mode gives greater efficiency to the editing of film material transferred to the DVR-1000/DVPC-1000 in 525/60. Once the IN point and field number of the first edit are set, the DVR-1000/DVPC-1000 will automatically set the OUT point and field numbers of the edits to follow so that each edit matches the 2-3 pull down sequence.

Note: The Graphic Operation mode is used for editing film material transferred in 625/50.

## Automatic Tracking

User friendly operation is always one of the main objectives in Sony's philosophy of designing VTRs. The DVR-1000/DVPC-1000 incorporates automatic tracking, as a result of this philosophy. In normal playback, automatic tracking not only eliminates the manual tracking adjustments as was required in conventional non-DT VTRs, but provides the best playback condition at all times by continuously and precisely monitoring the off-tape RF level and feeding this back to the servo system.

## Reliable Mechanical Construction

The main objective in designing the tape transport of the DVR-1000 was to eliminate mechanical forces which will result in tape damage. This has been accomplished by the adoption of advanced mechanical technology. In the DVR-1000, the tape tension around the drum is kept at the lowest without a compromise in head-to-tape contact. This was made possible by the application of unique head mounting technology using optical methods to provide the optimum mounting angle and head projection. The use of the well considered tape transport layout in combination with the precisely designed roller guides, minimizes the increase of the tape tension around the drum and transport guides caused by sudden tape speed variations. Thus, smooth tape running is ensured no matter how the DVR-1000 may be operated. The DVR-1000 also offers the gentlest tape threading by maintaining the lowest possible tape tension at all times until transport guides are located at their final positions. This, too, significantly contributes to the reliable operation of the DVR-1000.

## Easy Service and Maintenance

Serviceability was also an important feature taken into consideration in designing the DVR-1000/DVPC-1000. All of the circuitry of the DVR-1000 and DVPC-1000 resides on plug-in type boards for convenient servicing using extension boards. The DVR-1000/DVPC-1000 employs a sophisticated self-diagnostics system to detect the condition of the VTR before and during operation. All of the diagnostics information required for maintenance purposes is provided via the control panel's EL display. A BYPASS TEST feature is also incorporated in the DVPC-1000 to check whether each board functions properly. This includes built-in video/audio test signal generators and 7 bypass routes which serve to isolate and check boards where malfunction is suspected.

## INTERFACE FACILITIES

### Digital I/O

#### Parallel Interface (video)

The DVR-1000/DVPC-1000s parallel digital interface conforms to the SMPTE RP-125 and EBU Tech 3246 standards. Digital interface with other D-1 VTRs or other parallel interface equipment is possible via this port. D-1 to D-2 format conversion and vice versa is also available via this port using the optional digital converters (DFX-1200/2100).

#### Serial Interface (video)

The DVR-1000/DVPC-1000 is equipped with one serial input and two serial outputs, each of which handles digital video on one single, low cost coaxial cable. This greatly simplifies system connections and enables long distance transmission of the digital video signal with no signal degradation.

#### AES/EBU Digital Audio

The digital audio interface conforms to the AES/EBU format (48kHz sampling) and is synchronized with video. The four channels of digital audio may also be interfaced via the D-sub 15-pin connectors.

### Analog I/O

The DVR-1000/DVPC-1000 also accepts analog audio and analog component video. The analog video signal may be R/G/B/Sync, Y/R-Y/B-Y, or Betacam™ CTDM.

### RS-422

Three RS-422 serial communication ports are equipped on the DVR-1000. Interface with various RS-422 equipped Sony machines, such as the D-2 VTRs, BVH series 1-inch VTRs, BVW series Betacam VTRs, BVU series U-matic VTRs, and BVE series editing control units, is possible.

### RS-232C/Parallel

The DVR-1000 is supplied with both the 25-pin RS-232C interface and the 50-pin parallel interface. Either interface may be installed on the DVR-1000 according to the user's requirements. The RS-232C interface allows connection with external equipment such as modems and microcomputers for error rate monitoring, etc, while the parallel port enables basic functions of the VTR to be controlled from custom made remote control units.

### Spare 2

By replacing this connector with the 8-pin interface adapter supplied with the BKDV-1010, control of the DVR-1000/DVPC-1000 becomes possible from the rear of the unit. The optionally available BKDV-102 remote control panel adapter is also connected to this 8-pin interface adapter via the 9-pin to 8-pin conversion cable for long distance (max. 1000m) control of the DVR-1000/DVPC-1000.

### CF pulse

The DVR-1000/DVPC-1000 is free from color framing restrictions as long as the component signals to be recorded are fed directly from a component signal source. However, when decoded component signals are recorded, color framing information is essential in order to keep signal impairment to a minimum when the signal is re-encoded. The DVPC-1000 has CF pulse I/O in order to match the encoding and decoding axis, further extending its power in a system having both component and composite parts.

### WFM OUT

The RF envelope of digital video and audio signals, or the CTL signal can be monitored via the MONITOR connector. A TRIGGER connector is also provided, so that monitoring of these signals can be done without supplying an additional reference signal to the waveform monitor.

### WFM

By connecting MONITOR on the DVR-1000 to WFM INPUT on the DVPC-1000, component R/G/B signals and RF envelopes of the digital video and audio signals, can be monitored from the OUTPUT connector. A SYNC OUT connector is also provided, so that monitoring of these signals can be done without supplying an additional reference signal to the waveform monitor.

Specifications

General	
Power requirements:	AC 100 to 120V / 220 to 240V ±10% selectable, 50/60Hz
Power consumption:	DVR-1000 350W DVPC-1000 850W
Operating temperature:	5°C to 40°C (41°F to 104°F)
Humidity (relative humidity):	20 to 80% (non-condensing)
Weight:	DVR-1000 48 kg (105 lb 13 oz) (including control panel) DVPC-1000 100 kg (220 lb 13 oz) (including casters)
Dimensions (w/h/d):	DVR-1000 436 × 325.5 × 688mm (17 1/4 × 12 7/8 × 27 1/8") (including control panel and feet) DVPC-1000 424 × 650 × 650mm (16 3/4 × 25 5/8 × 25 5/8") (including casters)
Recording format:	CCIR Rec. 657 (SMPTE D-1 / EBU Tech 3252)
TV standard:	525/60, 625/50 switchable
Tracks:	Video 600 tracks/sec 20 sectors/field (525/60) 24 sectors/field (625/50) Digital audio 600 tracks/sec 40 sectors/field (525/60) 48 sectors/field (625/50) Analog cue 1 track Time code 1 track Control 1 track
Tape speed:	286.588mm/sec. (525/60) 286.875mm/sec. (625/50)
Writing speed (relative speed):	35.63m/sec
Recording time:	34 minutes with Sony DCM-600 (16μm) 76 minutes with Sony DCL-1300 (16μm) 94 minutes with Sony DCL-1600 (13μm)
Cassette type:	D-1 cassette (L or M)
Recommended tape:	Sony high Hc (class 850 Oe) or equivalent
Servo lock time:	Within 2 sec (tape transport with frame capstan servo mode from STANDBY ON)
Tape timer accuracy:	± 1 frame (with continuous control track)
Edit accuracy:	0 frame (with time code)
Error correction:	As per standard (Reed-Solomon code)
Error concealment:	Adaptive three dimensional
Fast forward/rewind time:	Within 240 sec. (94 min. L cassette) Within 180 sec. (76 min. L cassette) Within 100 sec. (34 min. M cassette)
Load/unload time:	Within 8 sec.
Video	
Sampling frequency:	Y 13.5MHz R-Y/B-Y 6.75MHz
Channel coding:	Scrambled NRZ
Quantization:	8 bits/sample
Bandwidth:	Y 0 to 5.75MHz ±0.5dB, 6MHz ±3dB R-Y/B-Y 0 to 2.75MHz ±0.5dB, 3MHz ±3dB
S/N ratio:	56dB (unweighted)
Operating level:	R/G/B 0.7Vp-p Y (with sync) 1.0Vp-p R-Y/B-Y 0.7Vp-p Sync (IN) 0.28 to 4Vp-p (composite sync or black burst) (OUT) 4Vp-p (composite sync)
Transient response "K" factor (2T pulse):	Less than 1%
Video output delay:	1 frame (with respect to reference sync)
System timing delay adjustable range:	± 127 video samples (± 9.4 μsec)
Digital audio (Digital audio 1 to 4 channels)	
Sampling frequency:	48kHz (synchronized with video)
Quantization:	16 bits/sample
Frequency response:	20Hz to 20kHz ±1/3dB (at 1 kHz, + 8dBm nominal)
Dynamic range:	More than 90dB (at 1kHz, emphasis ON)
Distortion:	Less than 0.05% (at 1kHz, emphasis ON, operating level)
Crosstalk:	Less than -80dB (at 1kHz, between any two channels)
Wow and flutter:	Below measurable level
Headroom:	20dB

Design and specifications subject to change without notice.

Operating level:	IN + 28dBm to -10dBm (+ 8dBm nominal level, 600 ohm load) OUT + 8dBm, 600 ohm load
Emphasis:	T <sub>1</sub> = 50 μsec. / T <sub>2</sub> = 15 μsec. (ON/OFF selectable)
Audio output delay:	1 frame (with respect to reference sync)
Audio/video relative timing adjustable range:	± 80 audio samples (± 1.6 msec)
Analog audio (Cue track)	
Frequency response:	100Hz to 12kHz ± 3dB
S/N ratio:	Better than 42dB (from 3% distortion)
Distortion:	Less than 3%
Wow and flutter:	Less than 0.2%
Operating level:	+ 8dBm, 600 ohm load (MIC input: - 60dBs)

Input/Output Connectors and Signals

DVR-1000		
AUDIO	CUE IN	XLR, 600 ohms/10k ohms selectable, LINE or MIC
	OUT	XLR, 600 ohms
	MONITOR L/R CH	XLR, 600 ohms (DA-1/2/3/4 or cue channel)
TIME CODE	IN	XLR, 600 ohms/10k ohms selectable (SMPTE/EBU)
	OUT	XLR, 600 ohms (SMPTE/EBU)
HEADPHONES OUT		8 ohms, variable level control
WFM OUT		MONITOR: BNC, 75 ohms (RF envelope-A/B/C/D or CTL) TRIGGER: BNC, Hi-Z (50% duty, TTL, 150 Hz)
REMOTE	REMOTE-IN	D-sub 9-pin (for RS-422 interface)
	REMOTE-OUT	D-sub 9-pin (for RS-422 interface)
	REMOTE-IN/OUT	D-sub 9-pin (for RS-422 interface)
	RS-232C	D-sub 25-pin (for RS-232C interface)
	PARALLEL I/O	D-sub 50-pin (for parallel communication)
OTHERS	CN-A	D-sub 50-pin (to DVPC-1000)
	CN-B	24-pin (to DVPC-1000)
	SPARE 1	BNC (for future use)
	SPARE 2	BNC (for remote control from BKDV-1010)

DVPC-1000

	ITEM	DIGITAL	ANALOG
VIDEO	IN	D-sub 25-pin: RP-125/Tech 3246-E, parallel 9-pairs BNC: Digital Serial (270 Mb/sec)	BNC: 75 ohms (R/G/B/sync or Y/R-Y/B-Y) 12-pin MULTI: 75 ohms (Y/R-Y/B-Y for Betacam system)
	OUT	D-sub 25-pin: RP-125/Tech 3246-E, parallel 9-pairs BNC: Digital Serial (270 Mb/sec)	BNC: 75 ohms (R/G/B/sync or Y/R-Y/B-Y) 12-pin MULTI: 75 ohms (Y/R-Y/B-Y for Betacam system)
	PICTURE MONITOR OUT	—	BNC, 75 ohms (R/G/B/sync)
	WAVEFORM MONITOR OUT	—	INPUT: from DVR-1000 OUTPUT: BNC, 75 ohms (R/G/B, RF envelope-A/B/C/D or CTL selectable)
AUDIO	IN	XLR: AES/EBU format (monaural or stereo mode) D-sub 15-pin: Sony format (all four CHs)	XLR, 600 ohms/10k ohms selectable (monaural mode)
	LINE OUT	XLR: AES/EBU format (monaural or stereo mode) D-sub 15-pin: Sony format (all four CHs)	XLR, 600 ohms (monaural mode)
	ADVANCE OUT	D-sub 15-pin, Sony format (all four CHs)	—
REF	IN	D-sub 25-pin, RP-125/Tech 3246-E, parallel 9-pairs	BNC, 75 ohms (composite sync or black burst)
CF PULSE	IN	BNC, Hi-Z (50% duty, TTL, negative edge)	—
OTHERS	CN-A	D-sub 50-pin (to DVR-1000)	—
	CN-B	24-pin (to DVR-1000)	—

Supplied accessories

DVR-1000	
Control panel BKDV-1010	1
IF-210 board (RS-232C I/O)	1
Extension board (EX-129)	1
Rack mount fittings	2
AC power cord	1
Metal plate (attached at factory)	1
Operation and maintenance manual	1 set
DVPC-1000	
Extension board (EX-131)	1
Rack mount fittings	2
Connection cable (DVR-1000 ↔ DVPC-1000)	
CN-A (50-pin, 1m)	1
CN-B (24-pin, 1m)	1
Parallel digital video I/O cable (25-pin, 10m)	2
Digital audio I/O cable (15-pin, 10m)	2
Operation and maintenance manual	1 set

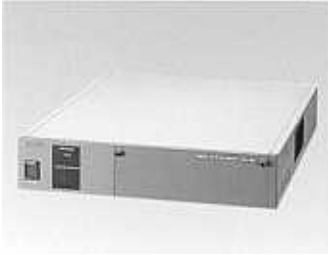


DVR-1000 Rear Panel



DVPC-1000 Rear Panel

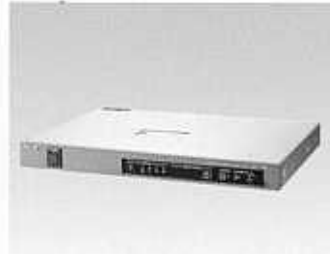
## Optional Accessories



**DFX-1200 (NTSC)**  
Digital Rate Converter  
(D-1 to D-2 format)



**DFX-2100 (NTSC)**  
Digital Rate Converter  
(D-2 to D-1 format)



**DDU-2100**  
Digital Audio Delay Unit



**DFX-2400**  
Digital Audio Sampling Rate  
Converter



**BKDV-1010**  
Control Panel for DVR-1000  
\*Note: One BKDV-1010 is supplied with the  
DVR-1000.



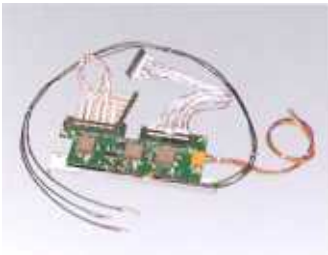
**BKDV-102**  
Control Panel Adaptor  
\*Note: BKDV-1010 is not included.



**BVX-D10**  
Digital Color Corrector



**BVX-100/100P**  
Digital Decoder  
(for analog composite signals)  
\*Note: Photo shows BVX-100.



**BKDV-1001**  
Serial Interface Kit  
\*Note: Equipped on models with serial numbers  
21001 ~ (U2), and 21101 ~ (EK1).



**SIF-1000**  
Serial Interface Unit



**BKM-2080**  
Digital 4:2:2 Input Kit  
(for BVM-1912 series, BVM-1910  
series, and BVM-1915 series)



**VCD-2D/5D/10D/30D**  
(2m, 5m, 10m, 30m)  
Parallel Digital Video I/O Cable  
D-sub 25-pin.



**ECD-3C/10C/30C**  
(3m, 10m, 30m)  
Audio cable (Digital or analog)



**RCC-5G/10G/30G**  
(5m, 10m, 30m)  
Remote Control Cable: D-sub 9-pin



**SMK-0032 (2m)**  
IEEE-488 Cable: 24-pin

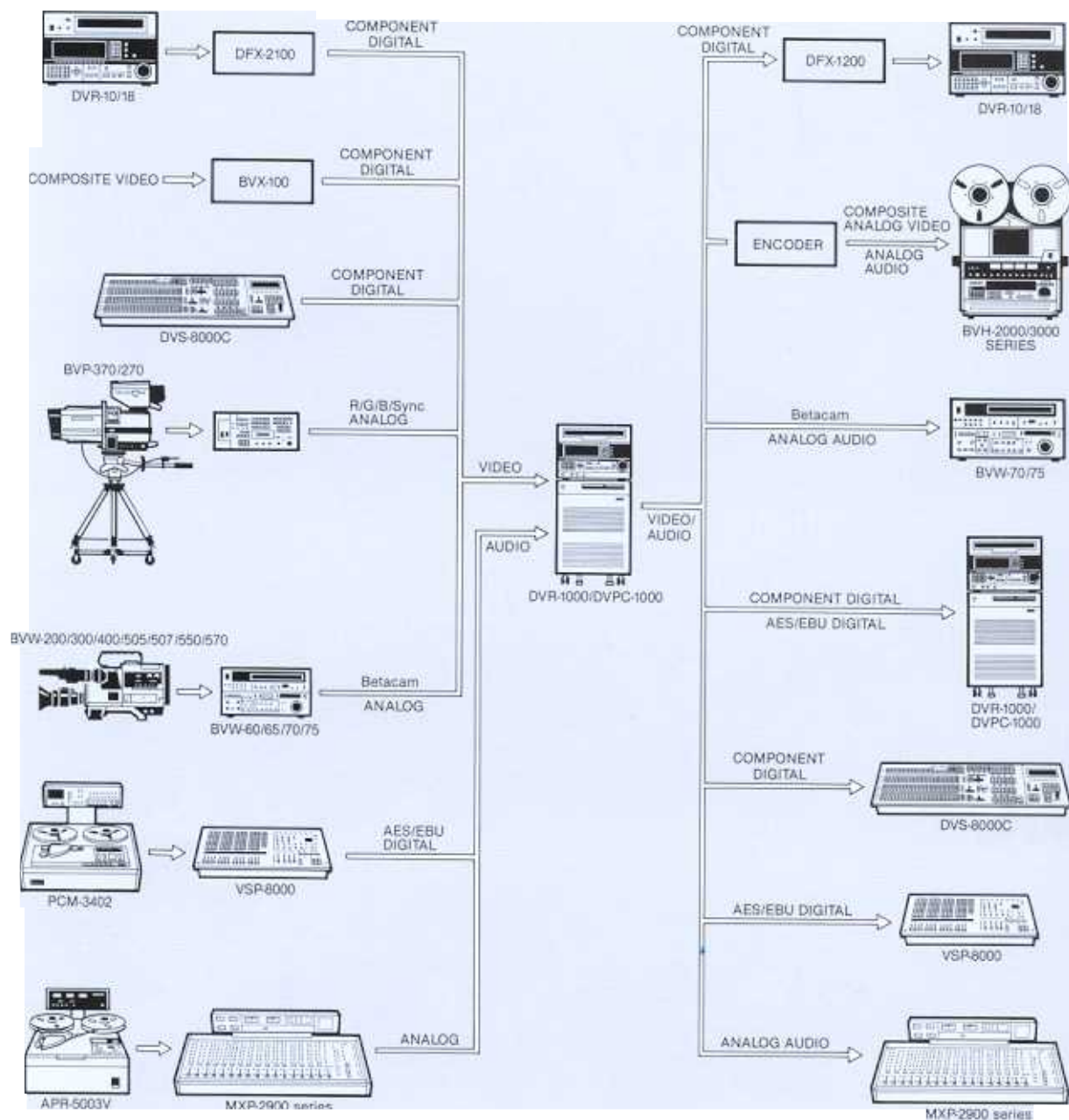


**DCM-200/400/600: M-size**  
(12 min., 22 min., 34 min.)  
Digital Videocassette



**DCL-1300/1600: L-size**  
(76 min., 94 min.)  
Digital Videocassette

## Basic Connections (1)



## Basic Connections (2)

