



Figure 3. CDC Model 1055-0005A Video Tape Recorder

VIDEO CONTROL UNIT

The Video Control Unit (VCU), P/N: 9489577-1, was designed and fabricated by the Aircraft Modification Center and is shown in Figure 4. The unit provides the following functions:

- Remote controls for the vertical and forward video camera lens and the VTR
- Interfaces to the DARMS
- Power distribution and control for OS Video System components

Separate zoom and focus controls are provided for each lens. A two speed switch is also provided to control the rate of change. The VCU utilizes the proportional focal length signal from each lens to provide control over their respective upper and lower zoom limits. To cure vignetting, caused by the window frames, the wide angle limit for both lens were changed. The limited focal length range for the vertical and forward looking lens is 15 to 102mm and 11 to 102mm respectively.

The VCU acts as the remote control for the VTR. The controls and indicators available are included in Table 2. Additionally, a "TITLE" control is provided for commanding the recorder to record (for 15 seconds) header/leader information from the DARMS.

The VCU provides signals to the DARMS that indicate when the VTR is recording and when titling begins and ends. DARMS annotates data on the vertical video signal whenever the VTR is recording, be it frame or header/leader annotation. A display mode control on the VCU tells the DARMS to decode annotation on the video signal going to the OS video displays. The VCU also distributes the proportional focal length signal from the vertical looking lens to the DARMS for data annotation.

Y/C VIDEO DECODER

A NovaY/C-P decoder, manufactured by Nova Systems, is used to convert the composite video from DARMS to Y/C for input to the VTR. A three line adaptive digital comb filter is employed to maximize video bandwidth, minimize cross color, cross luminance and "dot" crawl and provide up to 6dB of chroma noise reduction. Live action video maintains all the original detail. Graphics and titles are processed at full resolution without annoying composite video artifacts at color and detail transitions. The NovaY/C-P has a bandwidth of 6MHz and a resolution of 480 lines.

DATA ANNOTATION

The DARMS provides the necessary signals and information for data annotation of recorded video and annotation of header/leader information at the beginning of the video cassette. To accomplish this the DARMS utilizes circuitry that encodes data annotation in the vertical retrace period of every frame of video from the vertical camera. The DARMS outputs the encoded video signal to the Y/C decoder that converts the composite video signal to Y/C for input to the Video Tape Recorder.

DARMS also has an internal annotation decoder that provides a separate video signal output for the displays, which allows annotation to be "displayed" or "not displayed" as selected by the VCU. This decoder can also accept playback video from the VTR to display.

The DARMS has to be on for the vertical video to be passed on to OS Video System, insuring every frame of vertical video imagery that is recorded is annotated

Table 2
OS Video Tape Recorder Key Characteristics

Input Signal Format	PAL, 625 lines, 50Hz, Y/C color format
Record Format	SVHS
Signal/Noise Ratio	> 40dB (100% white field)
Bandwidth	> 4Mhz at -9dB
Horizontal Resolution	> 400 lines
Output Signal Format	PAL composite color format
Remoted Controls (via VCU)	Record, Fast Forward, Rewind, Play, & Stop
Remoted Indicators (via VCU)	Play, Record, & VTR ready
Controls/indicators on VTR	Eject control and Power On, Record, & Elapsed Time indicators
Power	+28VDC, 140W