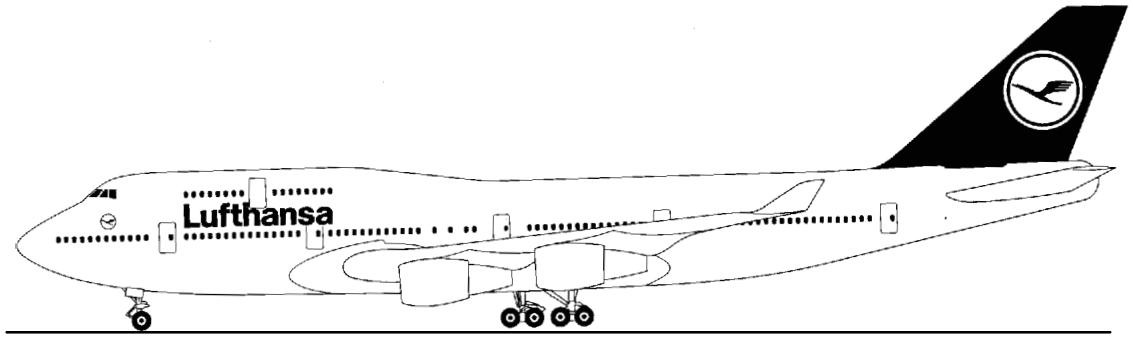
Lufthansa Technical Training

Training Manual B 747-400



ATA 23-32
PES Video

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ATA 23-32 PASSENGER ENTERTAINMENT SYSTEM VIDEO

PASSENGER ENTERTAINMENT (VIDEO) SYSTEM - INTRODUCTION

The passenger entertainment (video) system (PES video) supplies video entertainment to the passengers.

Video is shown on monitors and projectors.

Audio goes to the passenger address system and/or to headphones at each seat.

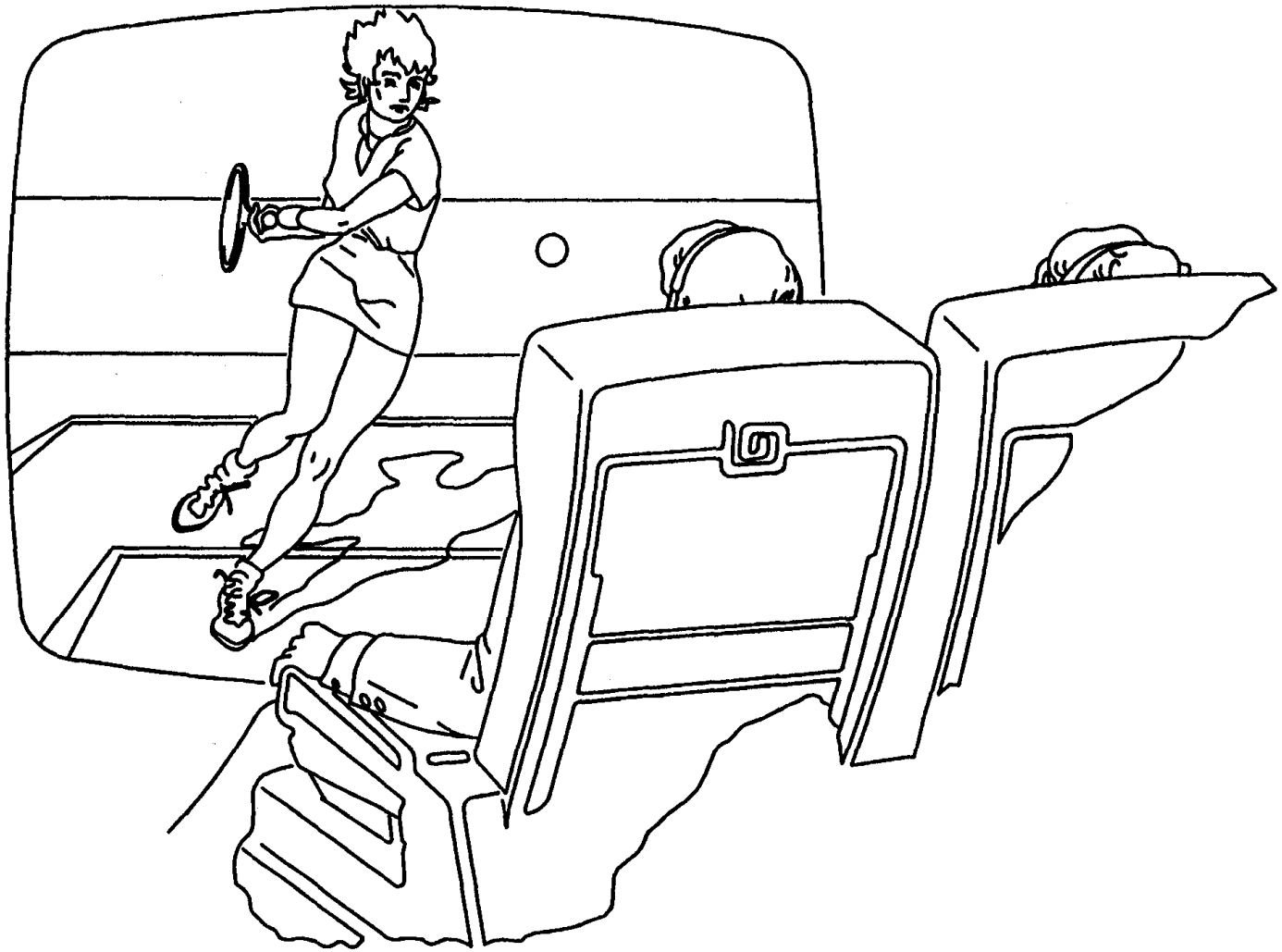

Figure 1 PASSENGER ENTERTAINMENT (VIDEO) SYSTEM - INTRODUCTION

PES VIDEO

The video control center (VCC) is the central location for operation and control of the video system.

The central component of the PES video system is the video system control unit (VSCU). The VSCU gets video and audio inputs and distributes them to the passenger cabin.

The VSCU gets video from the:

- Video tape reproducers (VTRs).
- AIRSHOW digital interface unit (DIU).

The cabin control unit (CCU) controls the DIU.

The VSCU gets audio from the VTRs.

The VSCU sends video through the video distribution units (VDUs) to the monitors and projectors in the passenger cabin.

The VSCU sends audio to the:

- Passenger entertainment system (PES) (audio), for distribution to individual passengers.
- Passenger address system, for distribution in the passenger cabin.

The VSCU sends a VIDEO IN USE signal to the cabin interphone system for display in the flight deck.

When cabin decompression occurs the decompression relay sends a discrete to the VSCU. This causes the VSCU to remove power from all video components.

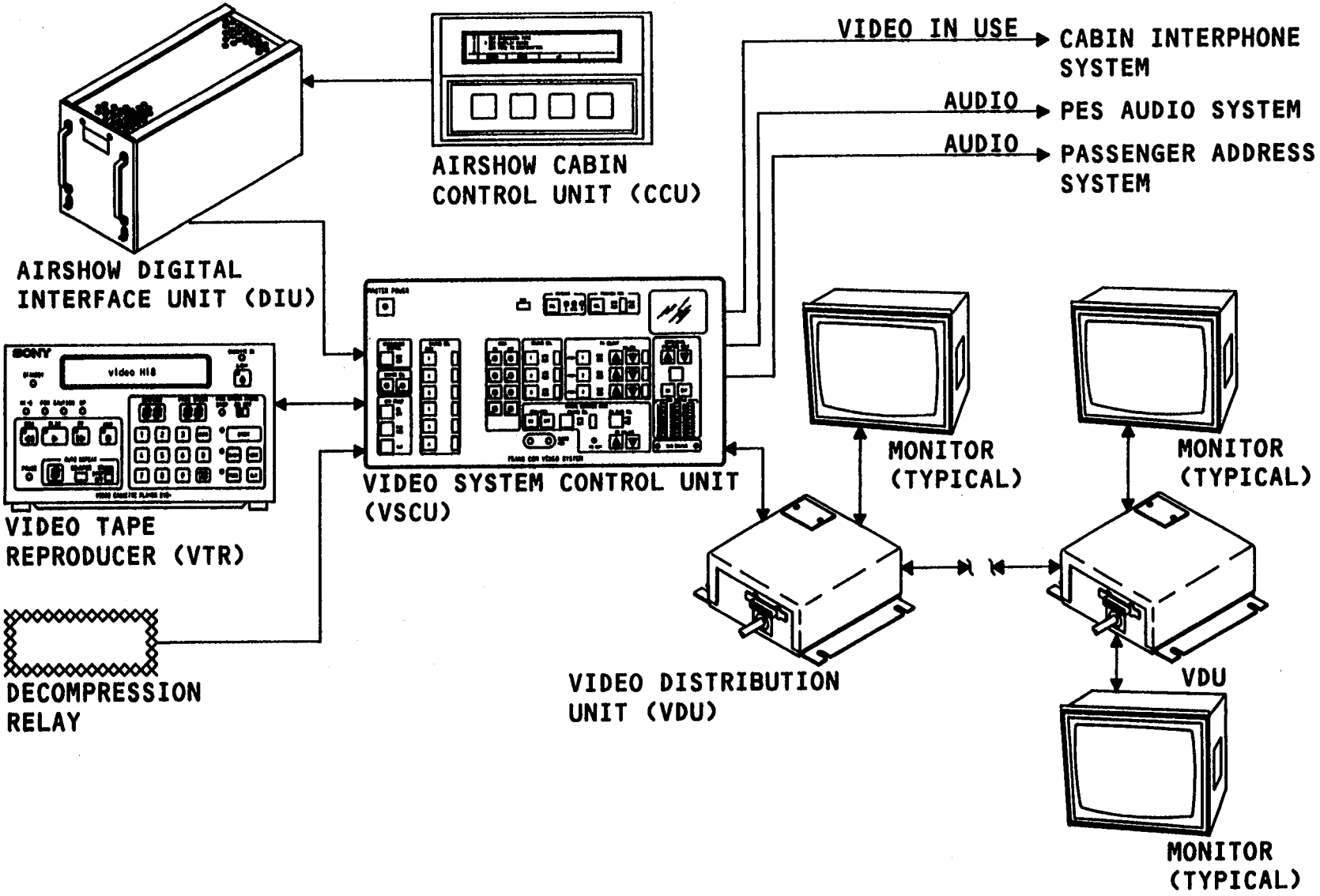

Figure 2 PES VIDEO

COMPONENT LOCATIONS - 1

The video control center (VCC) is on the main deck under the stairway to the upper deck and contains the:

- Video system control unit (VSCU)
- Video tape reproducer (VTR) 1
- VTR 2
- Airshow cabin control unit (CCU)

The video distribution units (VDU) are numbered based on their position in the airplane. All main deck VDUs are at water line (WL) 300, the upper deck VDU is at WL 393. Their stations (STA) and buttock lines (BL) are as follows.

VDU 1 is at STA 446 BL 0.

VDU 2 is at STA 505 BL 0.

VDU 3 is at STA 650 BL 0.

VDU 5 is at STA 1005 BL 0.

VDU 6 is at STA 1165 LBL 15.

VDU 7 is at STA 1358 LBL 15.

VDU 10 is at STA 1745 LBL 10.

VDU 11 is at STA 1987 LBL 10.

VDU UD - 1 is at STA 630 BL 0.

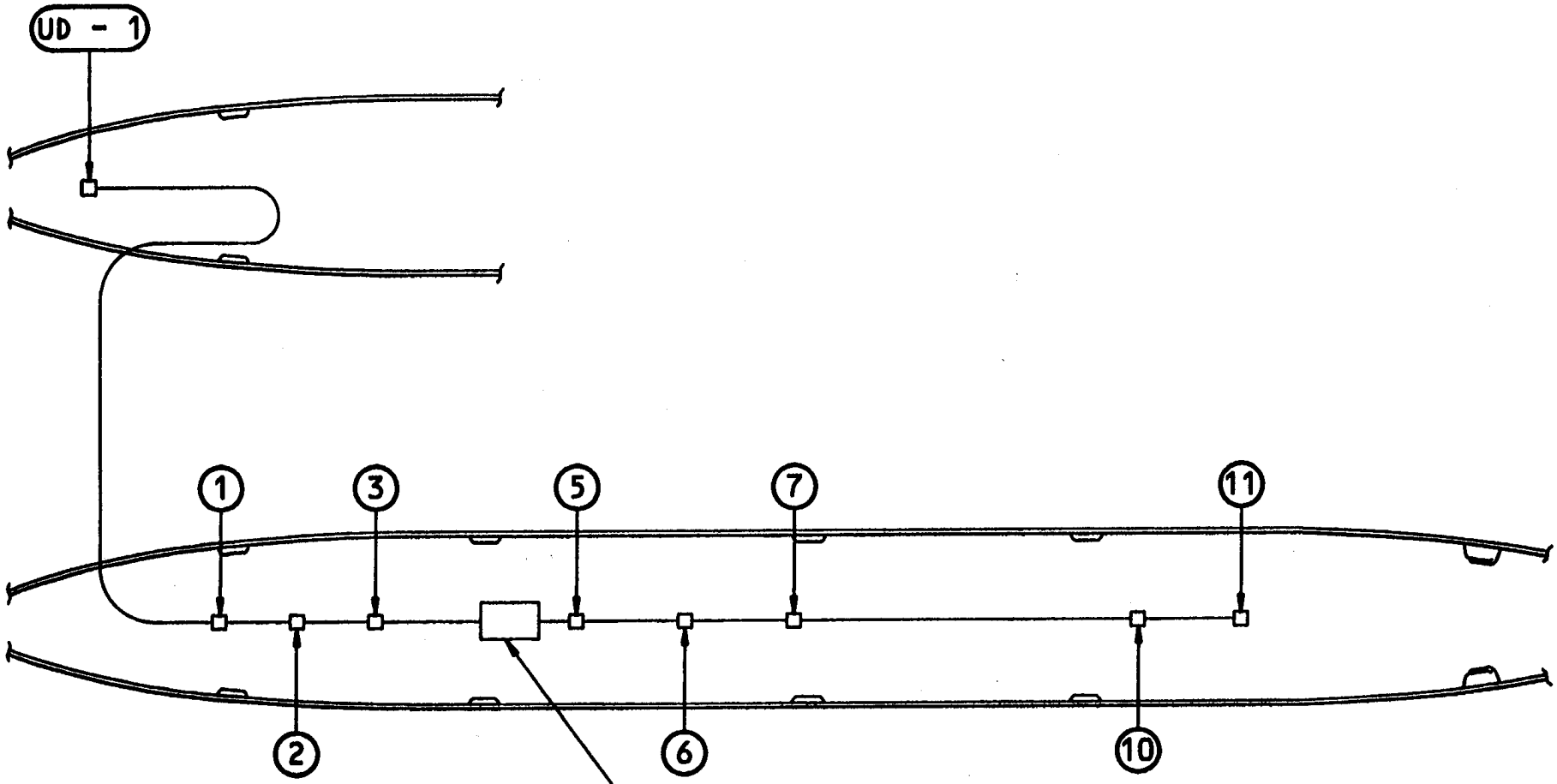

Figure 3 COMPONENT LOCATIONS - 1

COMPONENT LOCATIONS - 2

The PES video monitors (MON) and projectors (PROJ) are in the passenger cabin.

The 5 projectors are:

- Projector A at station 240 WL 280.
- Projector B at station 700 WL 280.
- Projector C at station 1040 WL 280.
- Projector D at station 1360 WL 280.
- Projector E at station 1880 WL 280.

The six five-inch LCD monitors are:

- Monitor 3 at STA 578 WL 260 LBL 100.
- Monitor 4 at STA 578 WL 260 RBL 100.
- Monitor 11 at station 975 WL 260 LBL 100.
- Monitor 12 at station 975 WL 260 RBL 100.
- Monitor 21 at station 1785 WL 260 LBL 100.
- Monitor 22 at station 1785 WL 260 RBL 100.

The two 16-inch monitors are:

- Monitor UD - 1 at station 450 WL 390 BL 0.
- Monitor UD - 2 at station 690 WL 390 BL 0.

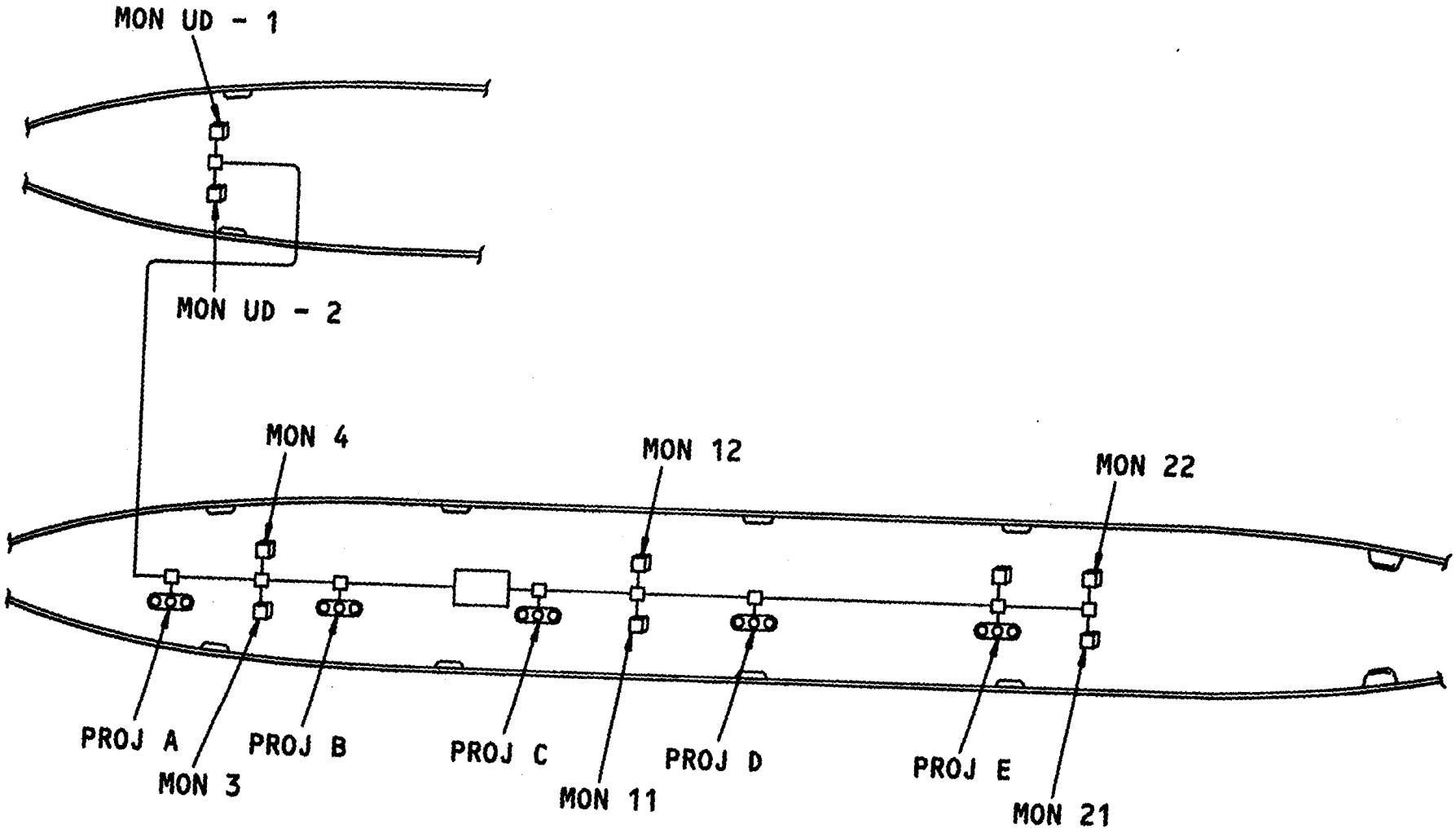

Figure 4 COMPONENT LOCATIONS - 2

COMPONENT LOCATIONS - 3

The video components located in the main equipment center are the:

- Video control center (VCC) dc circuit breaker
- Video control center (VCC) ac circuit breaker
- Video zone ac circuit breakers
- AIRSHOW digital interface unit (DIU)

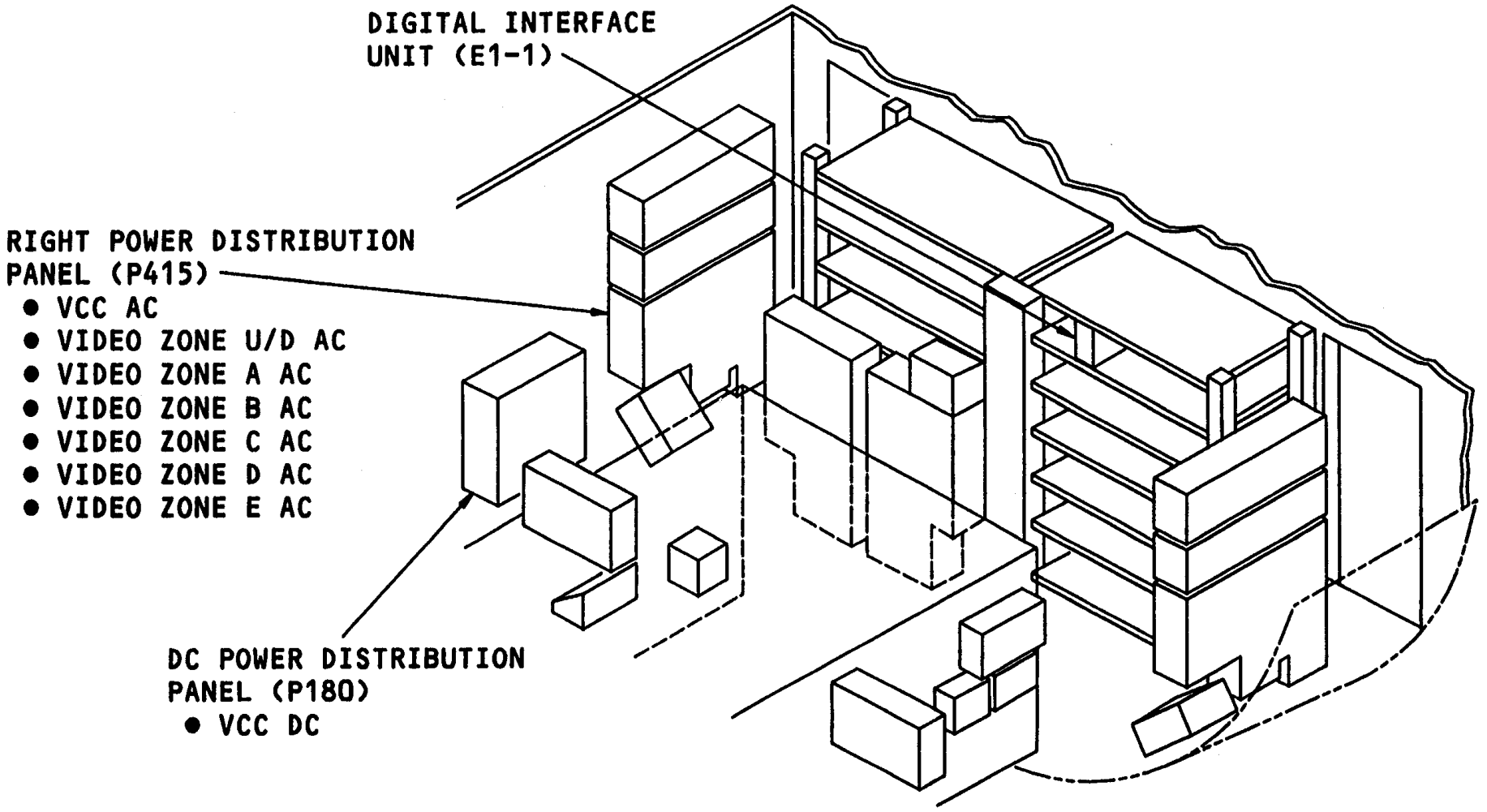

Figure 5 COMPONENT LOCATIONS - 3

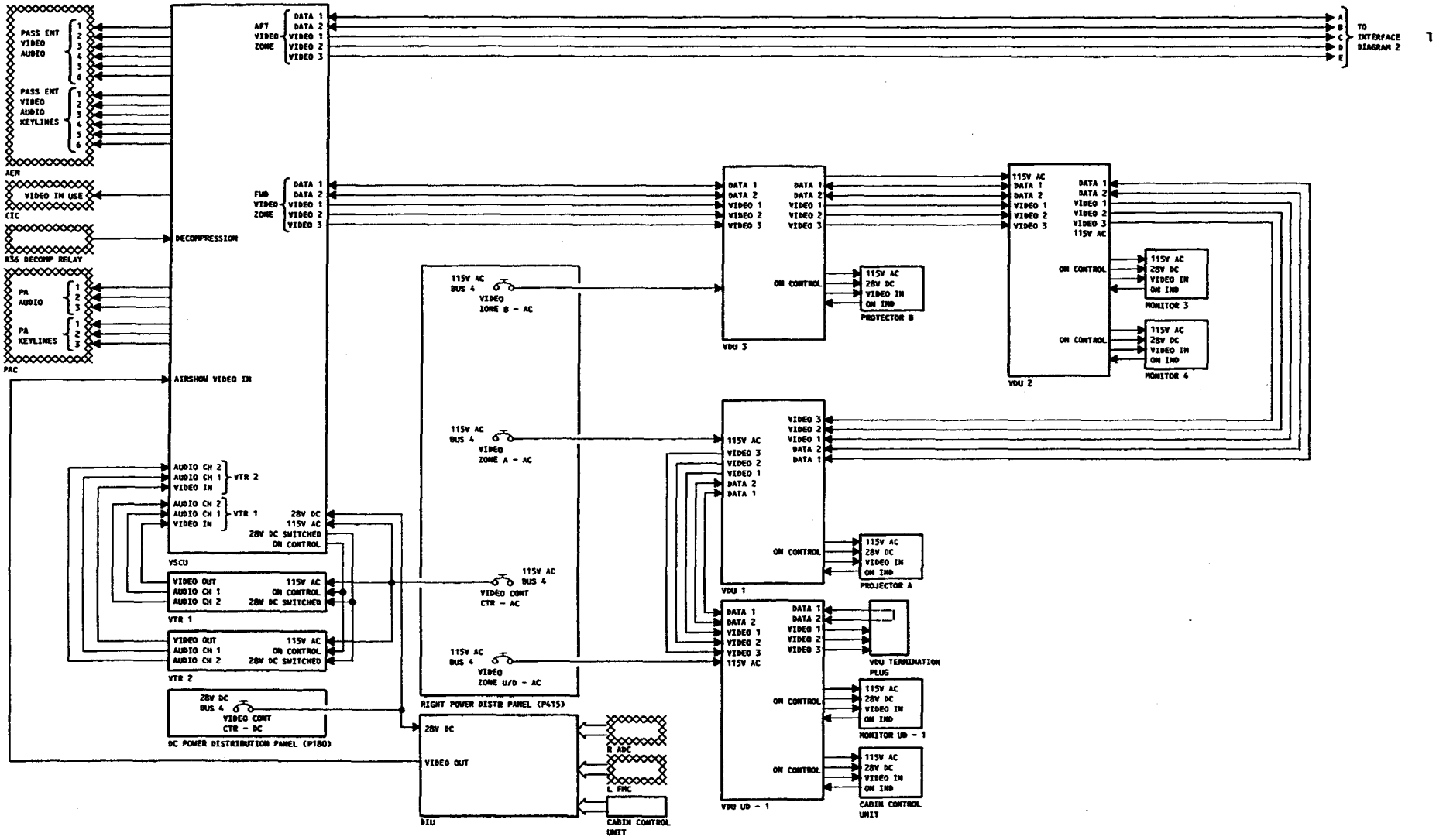

Figure 6 PES VIDEO - INTERFACE DIAGRAM - 1

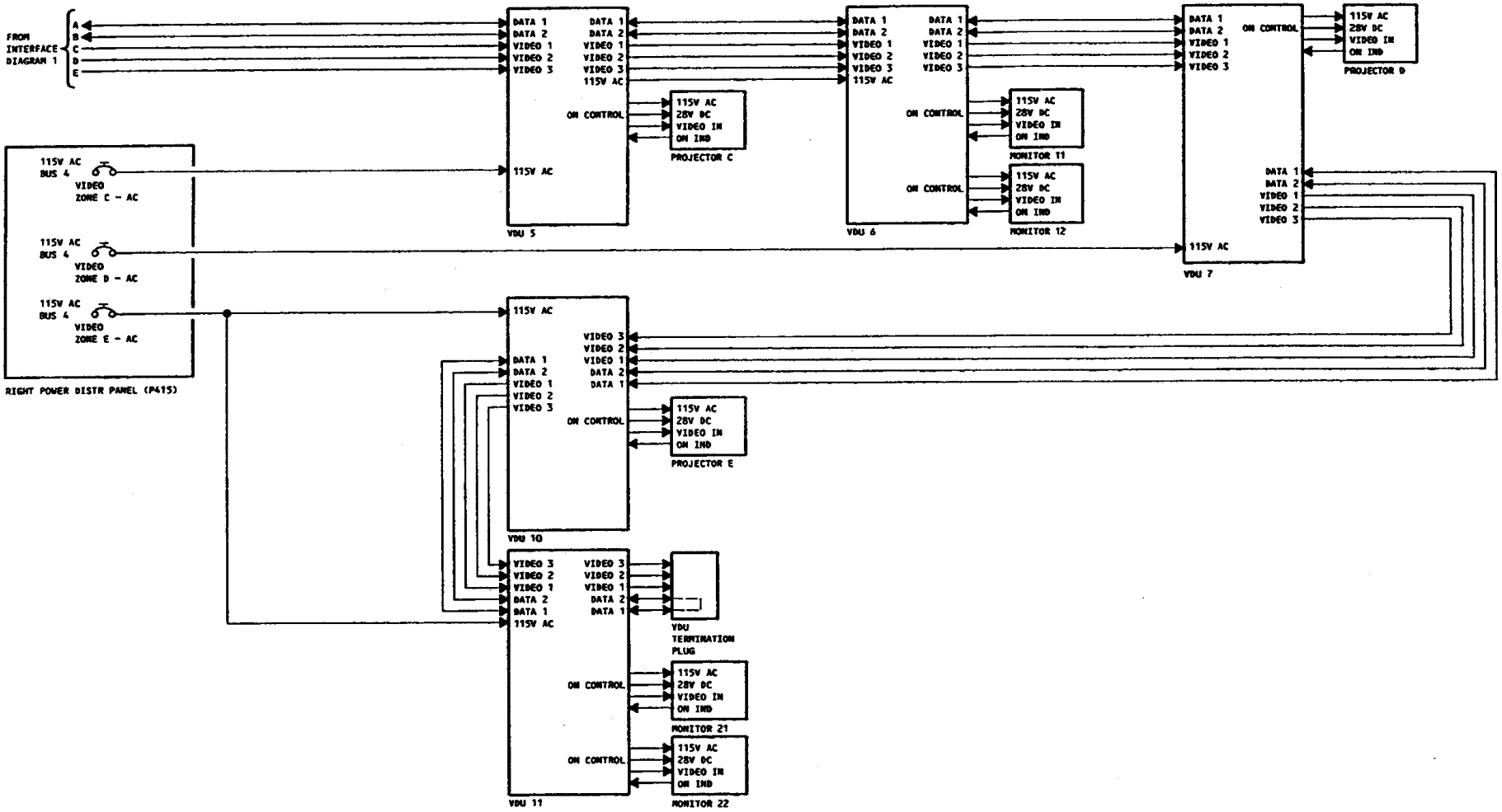

Figure 7 PES VIDEO - INTERFACE DIAGRAM - 2

VIDEO ZONES AND AREAS

Zones

The video system is divided into two zones, the forward and aft video zones.

All video components located forward of the video control center (VCC) and in the upper deck are in the forward video zone. All video components located aft of the VCC are in the aft video zone.

Areas

The PES video system has three separate video areas. Areas 1, 2 and 3 can show different video programs.

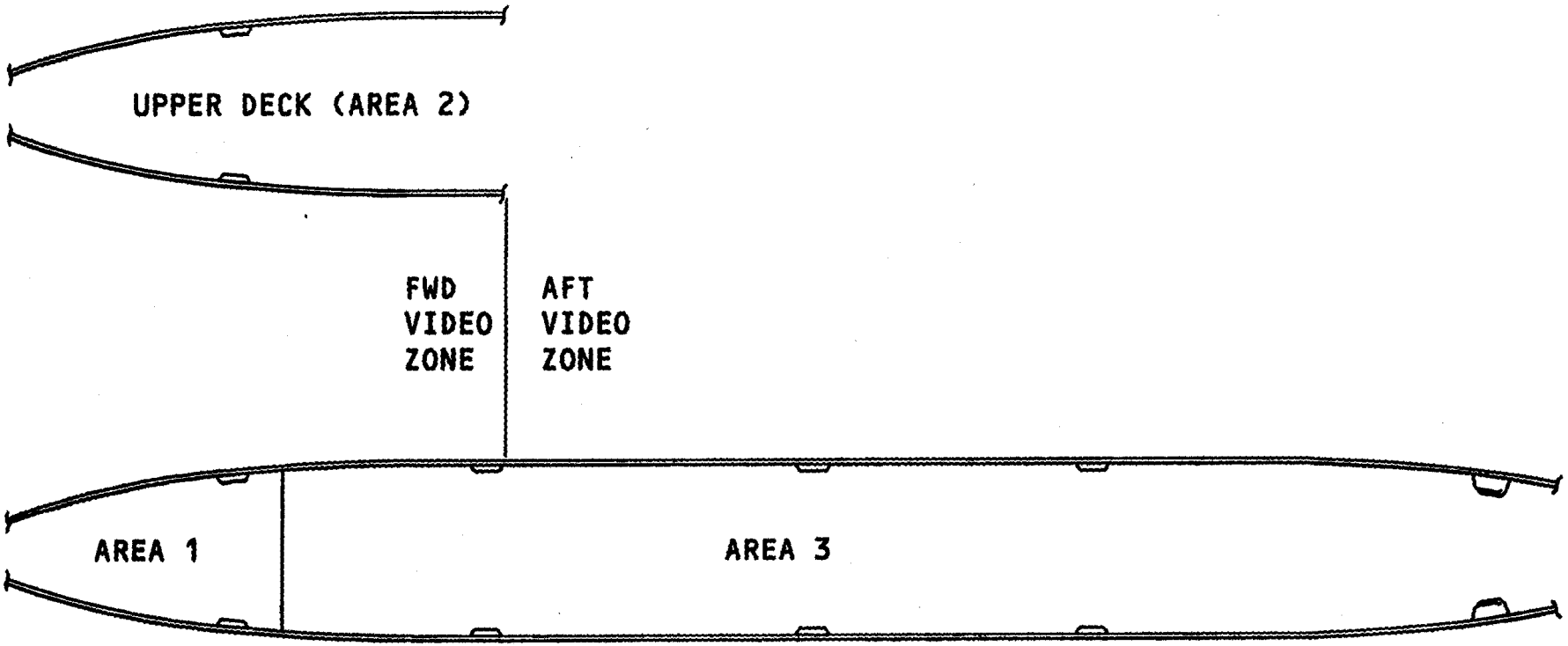

Figure 8 ZONES AND AREAS

POWER - FORWARD VIDEO ZONE

Video Control Center

The VIDEO CONT CTR - AC circuit breaker supplies 115v ac to the:

- Video system control unit (VSCU)
- Video tape reproducers (VTR) 1 and 2

The VIDEO CONT CTR - DC circuit breaker supplies 28v dc to the:

- VSCU
- Digital interface unit (DIU)

The decompression relay R36 sends a discrete to the VSCU if cabin decompression occurs. The VSCU removes power from all monitors and projectors when it gets the discrete.

The VSCU supplies 28v dc from an internal power supply to:

- VTR 1 and 2

Forward Video Zone

The VIDEO ZONE A - AC circuit breaker supplies 115v ac to:

- Video distribution unit (VDU) 1
- Projector A (through VDU 1)

The VIDEO ZONE B - AC circuit breaker supplies 115v ac to:

- VDU 3
- Projector B (through VDU 3)
- VDU 2 (through VDU 3)
- Monitors 3 and 4 (through VDUs 3 and 2)

The VIDEO ZONE U/D - AC circuit breaker supplies 115v ac to:

- VDU UD - 1
- Monitors UD - 1 and UD - 2 (through VDU UD - 1)

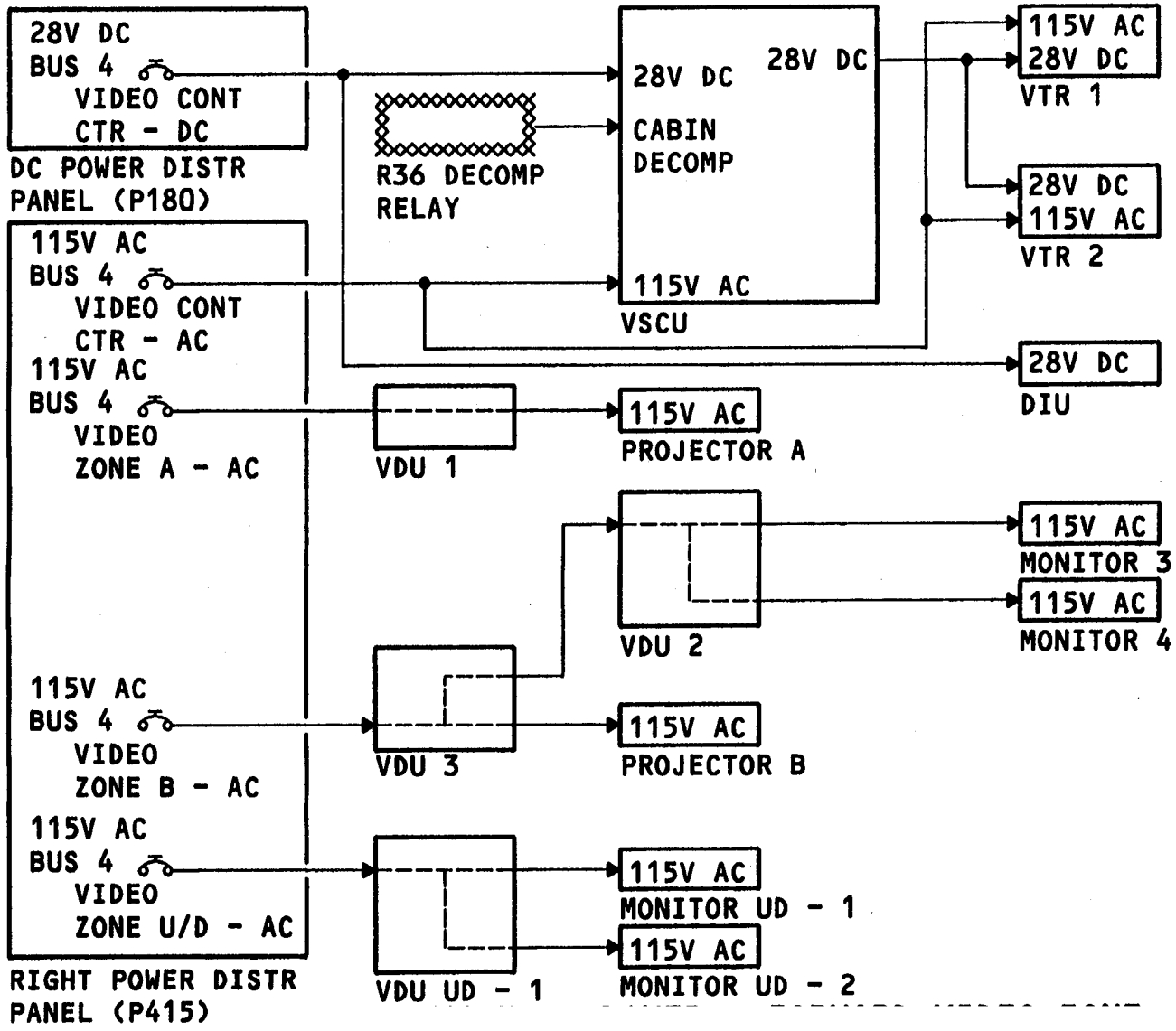

Figure 9 POWER - FORWARD VIDEO ZONE

POWER AFT VIDEO ZONE

The VIDEO ZONE C AC circuit breaker supplies 115v ac to:

- VDU 5
- Projector C (through VDU 5)
- VDU 6
- Monitors 11 and 12 (through VDUs 5 and 6)

The VIDEO ZONE D - AC circuit breaker supplies 115v ac to:

- VDU 7
- Projector D (through VDU 7)

The VIDEO ZONE E - AC circuit breaker supplies 115v ac to:

- VDU 10
- Projector E (through VDU 10)
- VDU 11
- Monitors 21 and 22 (through VDU 11)

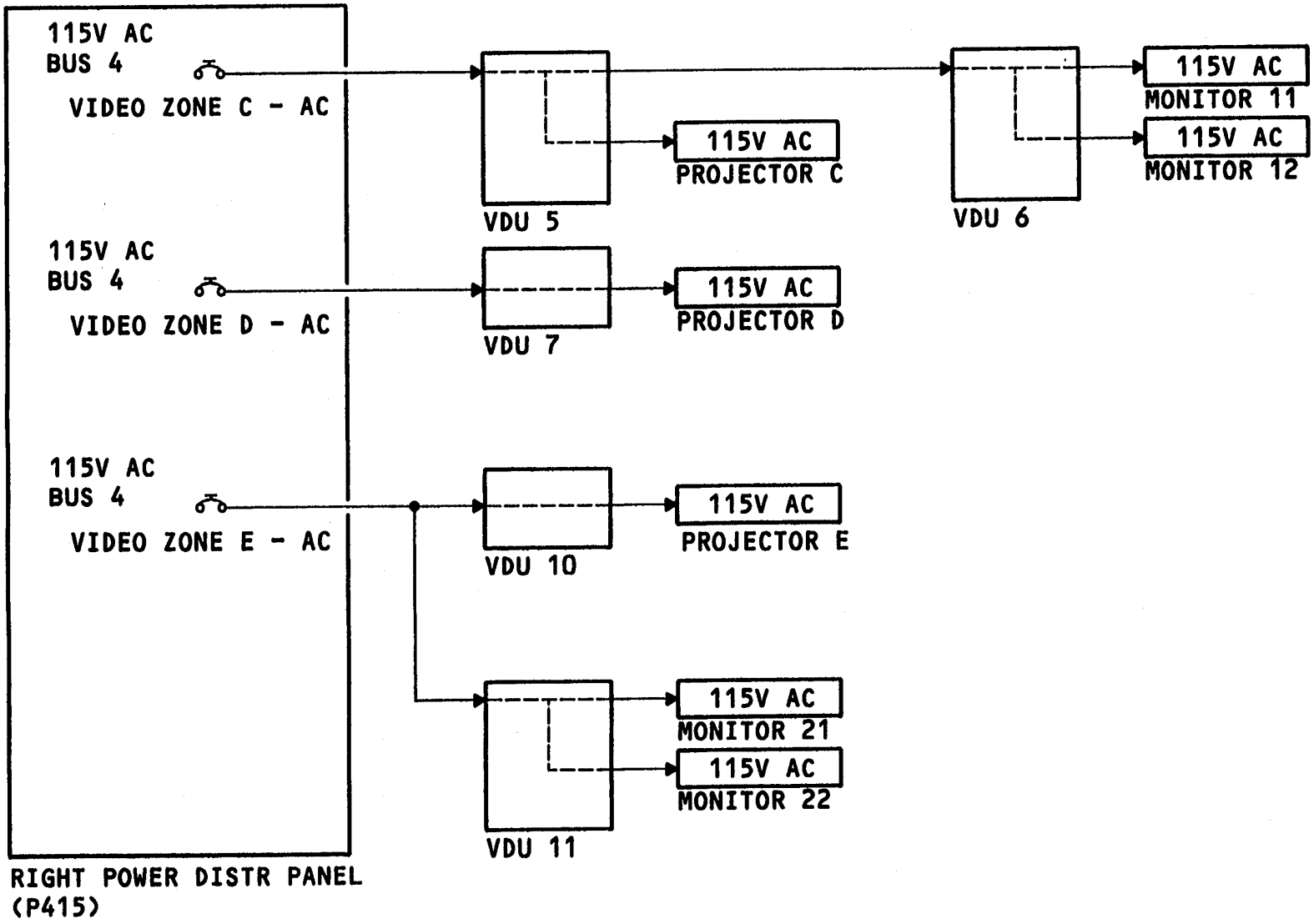

Figure 10 POWER - AFT

VIDEO SYSTEM CONTROL UNIT INTERFACE

VTRs

The VSCU sends an on control signal through the VTR CONTROL BUS to the VTRs. This signal causes a relay in each VTR to energize and apply power to the VTRs.

The VTRs send one channel of video and up to two channels of audio to the VSCU.

AIRSHOW

The AIRSHOW system DIU gets:

- Air data from the right air data computer (ADC).
- Flight data from the left flight management computer (FMC).

The DIU sends video to the VSCU in four different display modes.

The cabin control unit (CCU) sets the display mode and other items for the DIU.

The display modes are:

- Map. In this mode the DIU sends high resolution maps to the VSCU.
- Logo. In this mode the DIU sends the customer logo to the VSCU.
- Info. In this mode the DIU sends alphanumeric flight information to the VSCU.
- Auto. In this mode the DIU sequences through the other modes automatically.

The other items the CCU sets for DIU are:

- - Time to destination
- - Select destinations
- - Select languages
- - Set universal time constant (UTC)

CIC

The VSCU sends a VIDEO IN USE discrete to the cabin interphone controller (CIC) when power is applied to the VSCU.

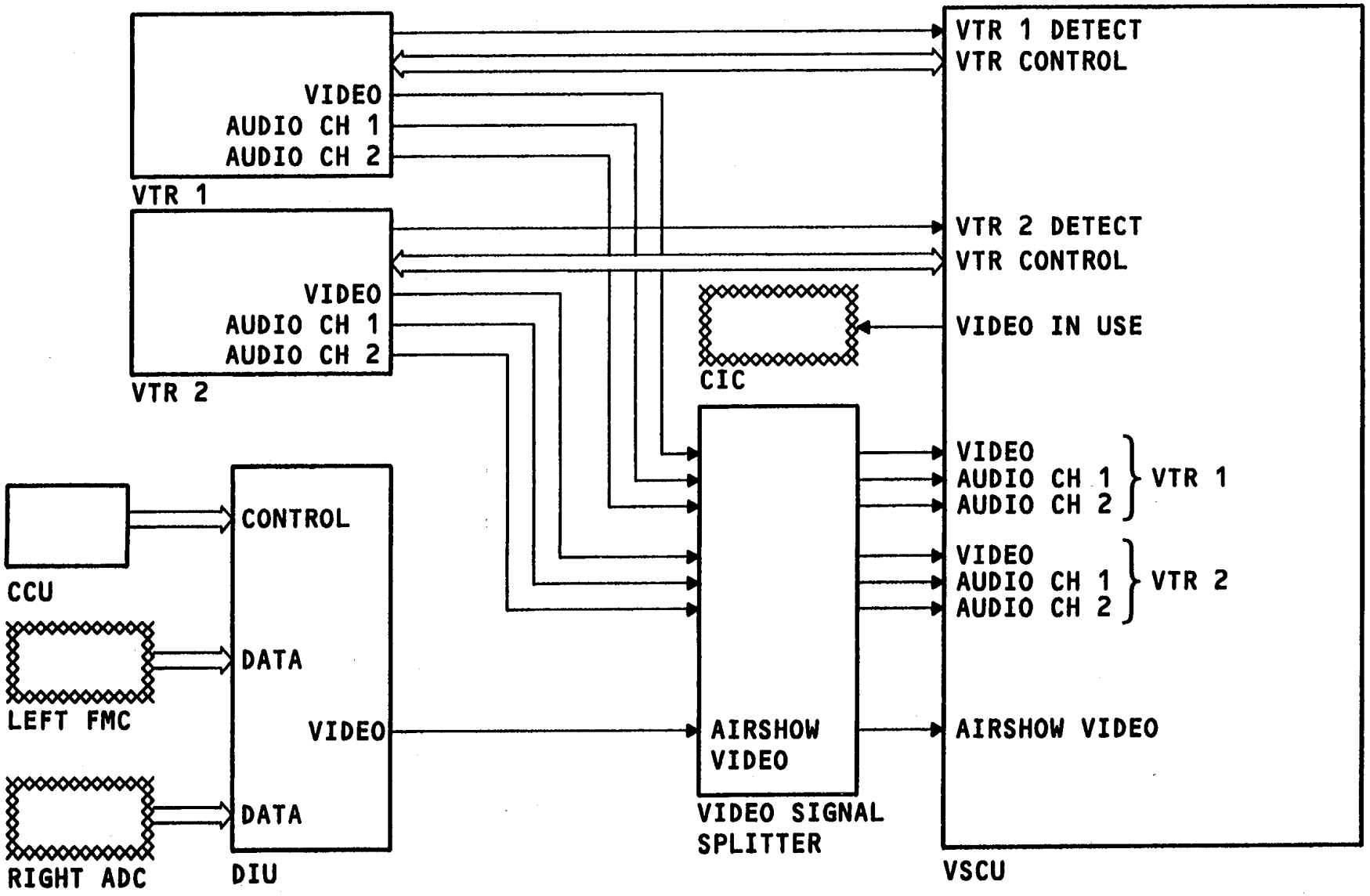

Figure 11 VIDEO SYSTEM CONTROL UNIT INTERFACE

VDU - FORWARD VIDEO ZONE

VSCU

The VSCU sends video and data to the first VDU in the forward and aft video zones. The data is sent on bidirectional data lines, DATA 1 and DATA 2. The data sent is:

- Command data
- Built-in test equipment (BITE) test commands

The VDUs send system status and BITE test results to the VSCU on the data lines.

VDUs

The VDU receives data and three channels of video from the VSCU or previous VDU.

The VDU sends one channel of video, 28v dc and an ON CONTROL signal to 1 projector or 2 monitors.

The monitors and projectors send an on indication (ON IND) discrete to the VDUs when they are energized.

The data and all three channels of video are sent to the next VDU or a VDU termination plug, if the VDU is the last VDU‘ in a column. The maximum number of VDUs to a column is 24.

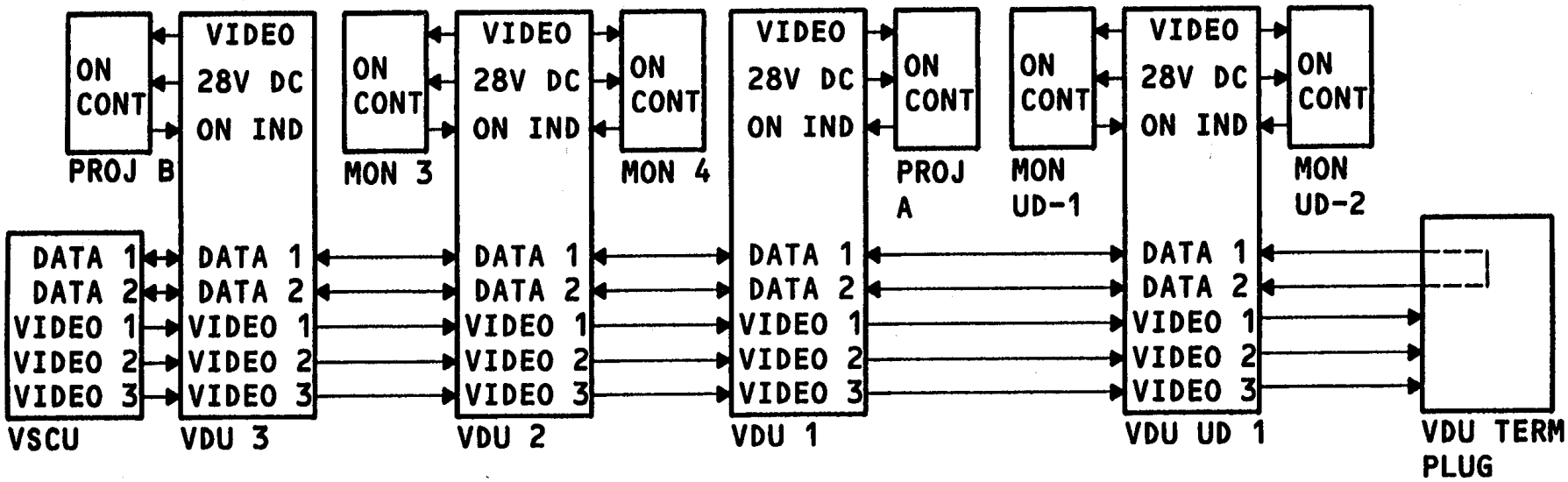

Figure 12 VDU INTERFACE - FORWARD VIDEO ZONE

VDU INTERFACE - AFT VIDEO ZONE

VSCU

The VSCU sends video and data to the first VDU in the forward and aft video zones. The data is sent on bidirectional data lines, DATA I and DATA 2. The data sent is:

- Command data
- Built-in test equipment (BITE) test commands

The VDUs send system status and BITE test results to the VSCU on the data lines.

VDUs

The VDU receives data and three channels of video from the VSCU or previous VDU.

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The monitors and projectors send an on indication (ON IND) discrete to the VDUs when they are energized.

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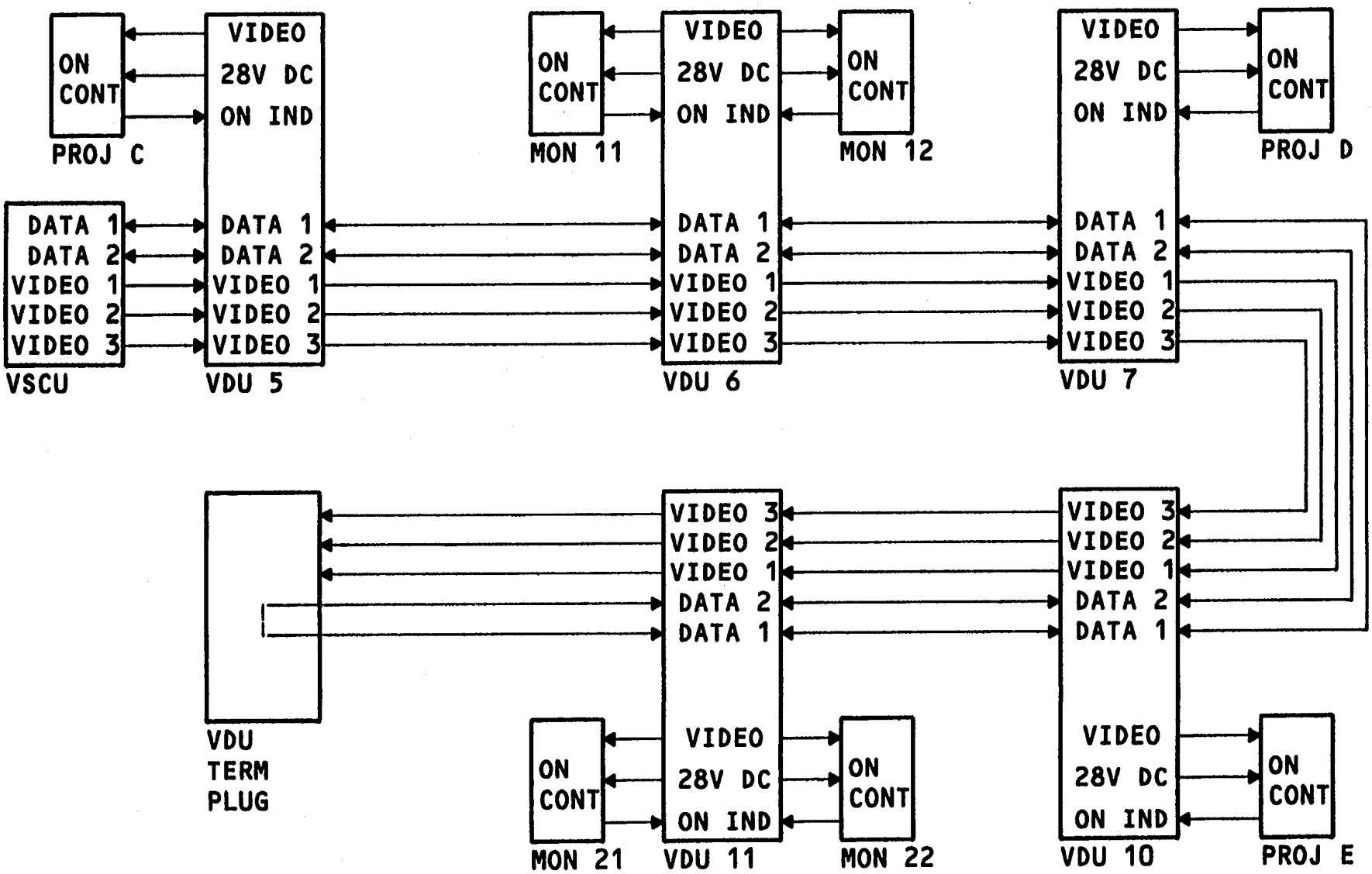

Figure 13 VDU INTERFACE - AFT VIDEO ZONE

VIDEO SYSTEM CONTROL UNIT AUDIO OUTPUTS

The VSCU sends the key lines and audio for distribution on the cabin to the:

- Audio entertainment multiplexer (AEM)
- Passenger address controller (PAC)

The VSCU sends audio in three different formats. The VSCU sends to the AEM:

- A single channel of audio for each VTR, in monaural format.
- Two channels of audio for each VTR in bilingual format. one channel as the primary language and one channel as the secondary language. Channels 1A, 2A and 3A send primary language. Channels 1B, 2B and 3B send secondary language.
- Two channels of audio for each VTR, in stereo format.

The VSCU sends to the PAC the audio for the 3 PA areas set at the front panel of the VSCU.

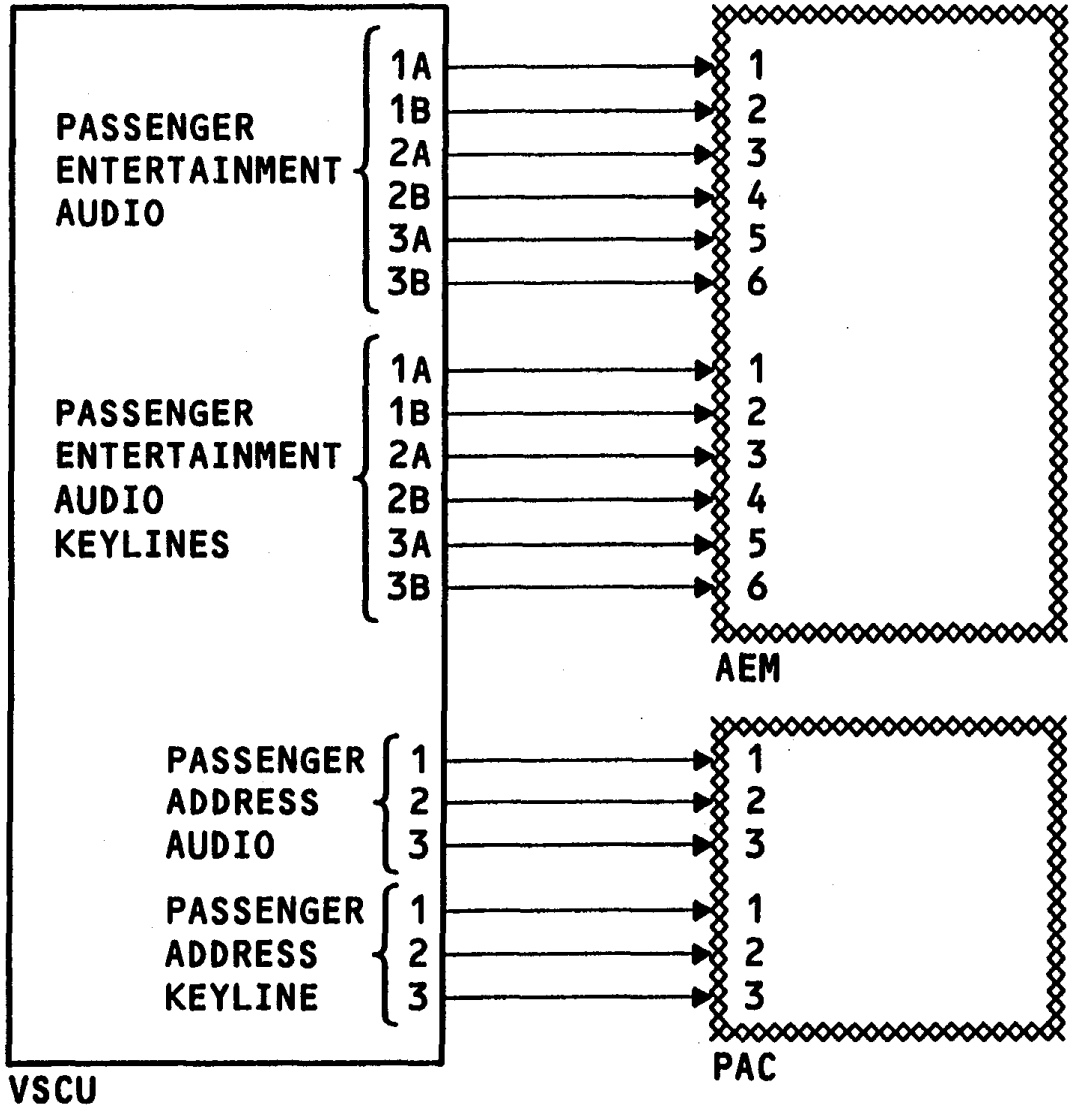

Figure 14 VSCU - AUDIO OUTPUTS

VIDEO SYSTEM CONTROL UNIT

Purpose

The video system control unit (VSCU) controls the PES video system.

General

The MASTER POWER switch controls power to all PES video components.

An elapsed time indicator (ETI) shows how long the system has operated.

Preview Monitor

A two-inch monitor shows preview video and is controlled by the PREVIEW MON group controls.

The PREVIEW MON group contains the SEL push button. Push the SEL button to set the video source shown on the preview monitor. it also sets the related audio track sent to the AUDIO headphone jacks.

The indications in the PREVIEW MON group are the;

- VTR indicator. This indicator is on when the preview monitor source is a video tape reproducer (VTR).
- AUX indicator. This indicator is on when the preview monitor source is not a VTR.
- PRI indicator. This indicator is on when the primary audio channel is sent to the AUDIO headphone jacks.
- SEC indicator. This indicator is on when the secondary audio channel is sent to the AUDIO headphone jacks.
- LED display. The LED display shows the VTR or AUX source number that supplies the video to the preview monitor.

The AUDIO headphone jacks receive the audio channel sent by the PREVIEW MON SEL push button and are electronic Jacks.

Antenna Control

The ANTENNA area controls are not used.

AREA Group

The AREA group contains the on/off controls to all monitors and projectors.

Each video area has its own on/off power control. The switches in this group are the:

- Area 1 ON
- Area 1 OFF
- Area 2 ON
- Area 2 OFF
- Area 3 ON
- Area 3 OFF
- Upper deck (UD) ON
- Upper deck (UD) OFF

Push the ON switch to supply power to all projectors and monitors in an area. The switch shows white.

Push the OFF switch to remove power from all projectors and monitors in an area. The switch goes off.

SOURCE SEL Group

The SOURCE SEL group sets the video source for each video area. Push the numbered switches to set a video source for that area.

The indications in the SOURCE SEL area are:

- VTR and AUX to show what source is set for a video area.
- LEDs to show the numerical input source for a video area.

PA SELECT Group

The PA SELECT group controls the audio output to the passenger address (PA) system. The controls are the:

- Area select push buttons. Push the area select button to set the primary (PRI) or secondary (SEC) audio input from the input source, for output to the PA system.
- Volume control push buttons. Push the up arrow to increase the volume in a PA area. Push the down arrow to decrease the volume in a PA area.

PA SELECT Group (cont.)

The indications in the PA SELECT group are:

- LED indicators that show the set volume level for the PA areas. An indication of 0 shows that the PA output is off.
- PRI and SEC annunciations that show the audio input set for the PA areas.

INDIVIDUAL PROJECTOR/MONITOR CONTROL

The INDIVIDUAL PROJ/MON CONT area contains the controls to turn individual projectors and monitors on and off.

The controls in this area are the:

- Projector/monitor selection push buttons. Push the up or down arrow push button until the projector or monitor number is shown in the LED indicator.
- ON push button. Push the ON push button to supply power to the shown projector or monitor.
- OFF push button. Push the OFF push button to remove power from the shown projector or monitor.

The indications in the INDIVIDUAL PROJ/MON CONT area are:

- An LED indicator that shows the set projector or monitor number.
- The MON STATUS area that shows projector or monitor on/off condition.

The SYS STATUS indicators are yellow and orange. Proper operation is shown by the yellow light. The orange light shows that the built in test equipment (BITE) has detected a failure in the VSCU.

MANUAL OVERRIDE MODE

The MANUAL OVERRIDE MODE area is used to operate all video zones at the same time. The controls are:

- PROJ/MON ON/OFF control. Push the ON button to supply power to all projectors and monitors. Push the OFF button to remove power from all projectors and monitors.
- SOURCE SEL. Push the SOURCE SEL button to set a single video source for all video areas.
- PA CHAN SEL. Push the PA CHAN SEL to set the primary or secondary language as the PA output.
- PA VOLUME. Push the up arrow to increase the volume in all PA areas. Push the down arrow to decrease the PA volume in all PA areas.

The indications in the MANUAL OVERRIDE MODE area are in the SOURCE SEL and PA CHAN SEL areas.

The indications in the SOURCE SEL area are:

- VTR/AUX, to show the type of source set.
- An LED indication to show the number of the source set.

The indication in the PA CHAN SEL area are:

- PRI/SEC, to show the audio channel set.
- An LED indication to show PA volume.
- PA KEY to show the PA key on/off in the override mode.

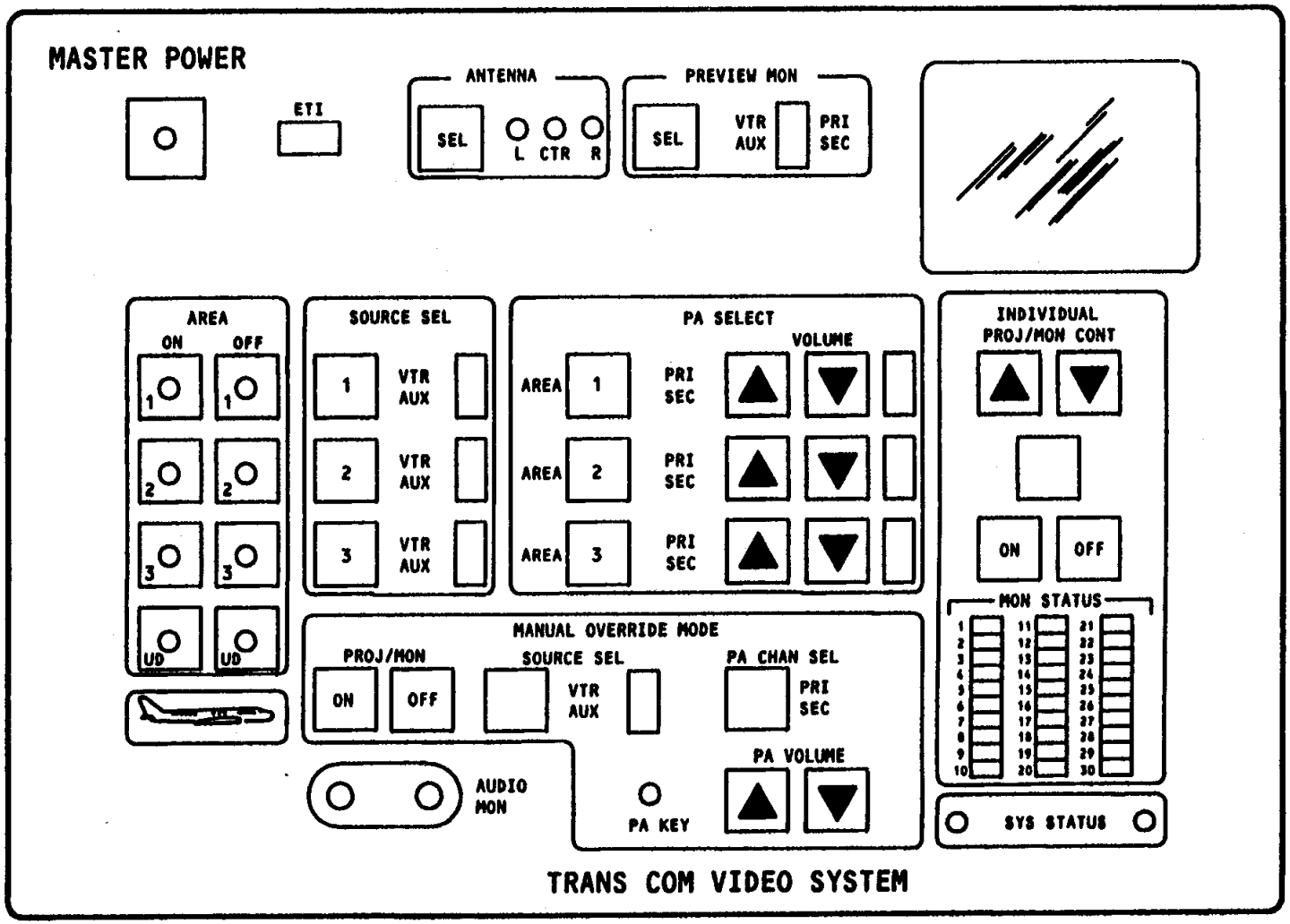

Figure 15 VIDEO SYSTEM CONTROL UNIT

VSCU DIP SWITCHES

The VSCU has 8 dual in-line package (DIP) switch assemblies, each with 8 DIP switches. They are located in the lower right corner on the back of the VSCU.

The VSCU DIP switches configure the video system. The switches define the:

- Number of VDUs in an area
- Audio configuration
- Number of VTRs
- Number of video sources
- Upper deck paring
- BITE enable
- Software configuration

The individual switches are slide switches. In the down position, the switch is off. In the up position, the switch is on. The switch housing shows switch position values.

Switch positions are listed in the maintenance manual.

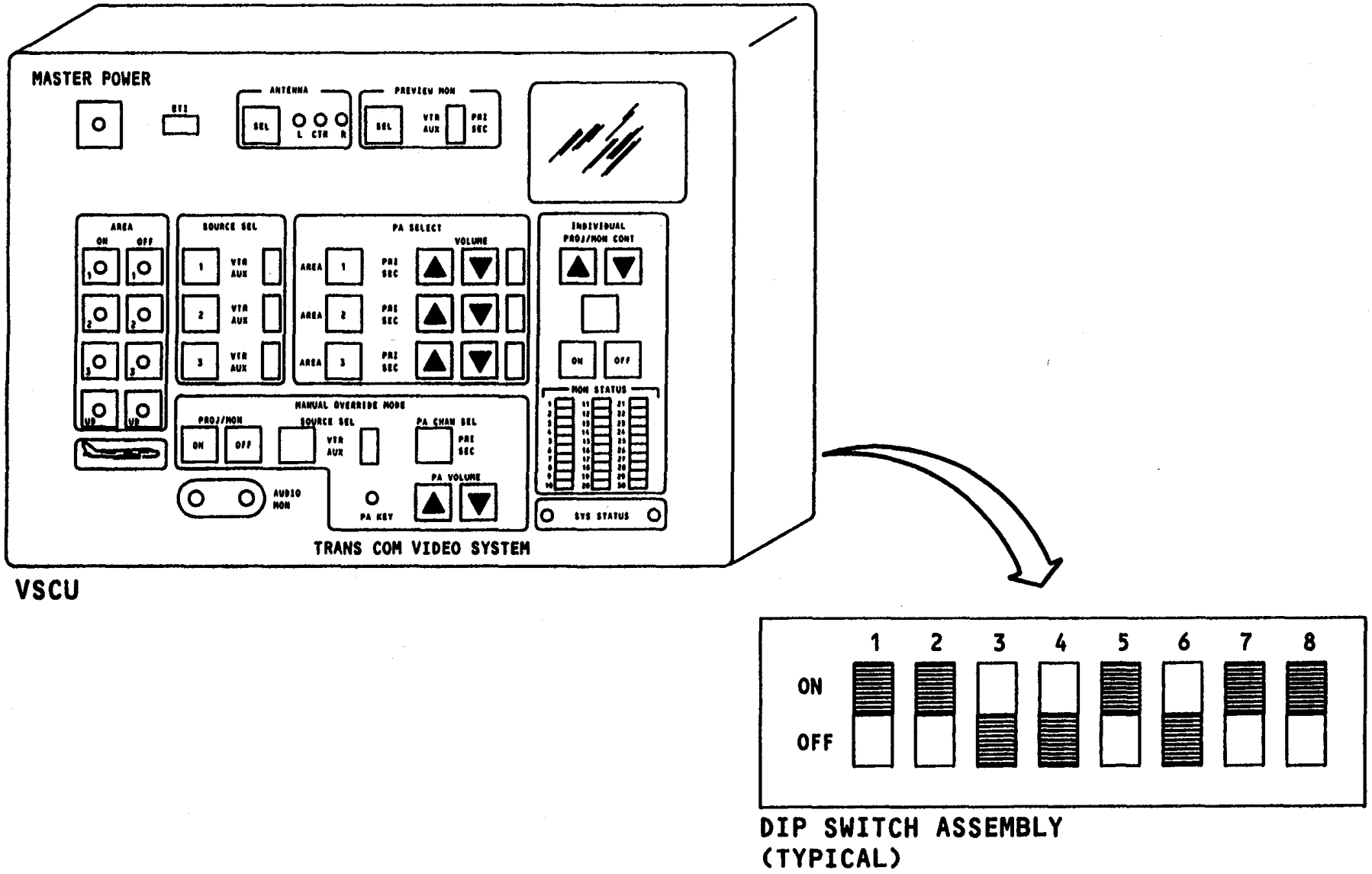

Figure 16 VSCU DIP SWITCHES

VDU AND TERMINATION PLUG

Purpose

The video distribution unit (VDU) performs these functions:

- Channel selection - ON/OFF control -Amplification of video signals -Transfer of video and data

Features

Each VDU has:

- Three quick disconnect jacks. Two for monitor and projector connections and one for a video and data line to the next VDU or termination plug.
- One plug for a video and data line from the previous VDU.
- One dual in-line package (DIP) switch assembly, on the top of the VDU under a cover, with 8 DIP switches.

The VDU DIP switches are used to define configuration data for the VDU. The data the switches define is the:

- Area the VDU is located in.
- Address of the VDU within the area.
- Number of monitors or projectors connected to the VDU.

The individual switches are slide switches. In the down position, the switch is off. In the up position, the switch is on. The VDU housing shows switch position values. Switch positions are listed in the maintenance manual.

Termination Plug

The termination plug is connected to the last VDU in each video zone. It has:

- Three 75 ohm resistors for impedance matching of video lines.
- One jumper connection for the data lines.

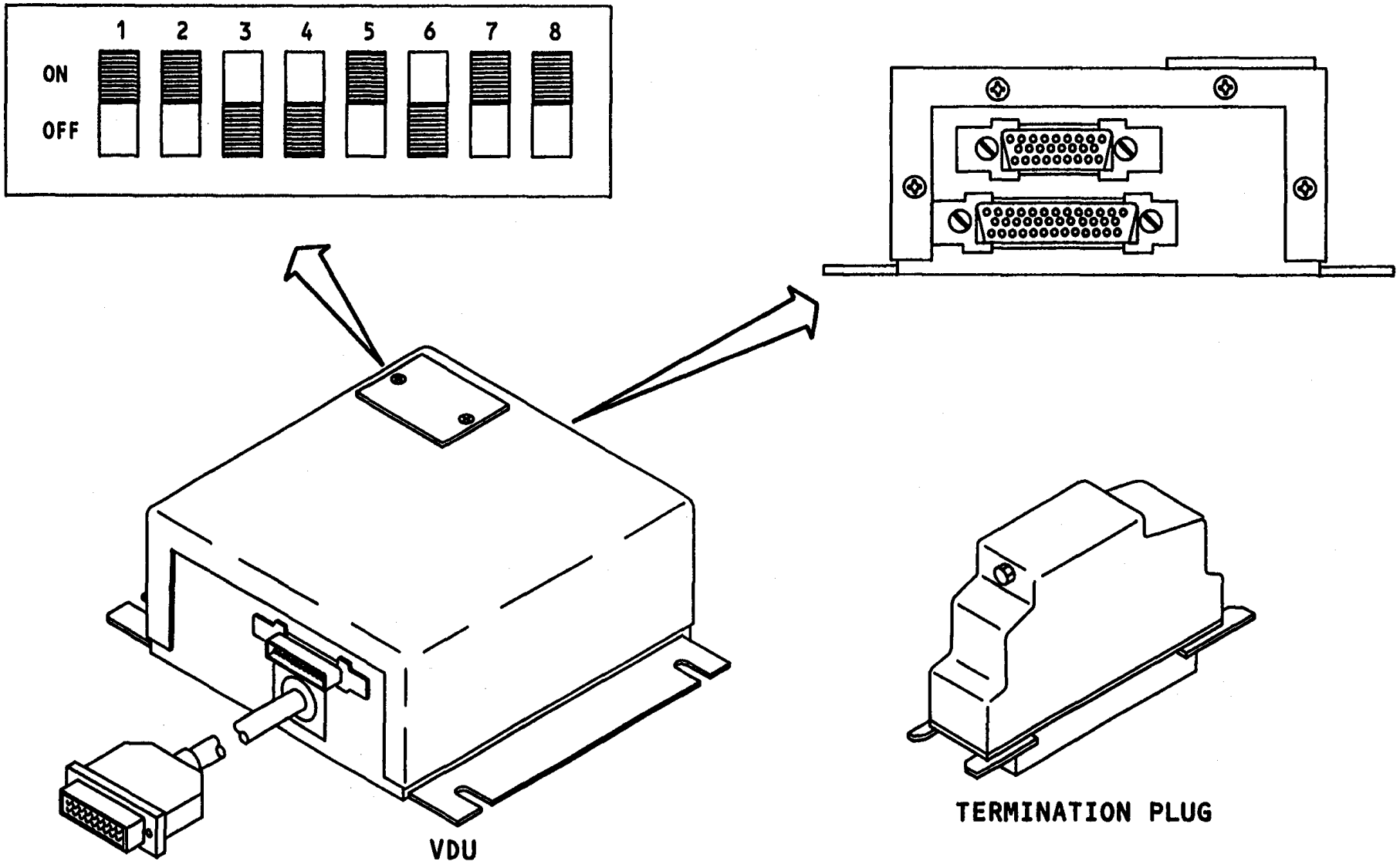

Figure 17 VDU AND TERMINATION PLUG

VIDEO TAPE REPRODUCER

Purpose

The video tape reproducer (VTR) sends video and audio signals to the VSCU and receives control is signals from the VSCU.

Controls and Indications

The VTR is operated under control of the VSCU or from the front panel. The VTR front panel controls are the:

- EJECT button. Push the EJECT button to remove the videocassette from the VTR.
- REW button. Push the REW button to rewind the videocassette.
- PLAY button. Push the PLAY button to start the video cassette and send video and audio signals to the VSCU.
- FF button. Push the FF button to fast forward the videocassette.
- STOP button. Push the STOP button to stop the videocassette tape movement.

AUTO REPEAT ON/STOP/OFF switch. Set the switch to the ON position to start the auto repeat mode. Set the switch to the STOP position to stop the tape at the blank portion. Set the switch to the OFF position to stop the auto repeat mode.

VTR program keypad. This keypad controls random access programing for the VTR.

The front panel indications are the:

COUNTER.

STANDBY indicator. The indicator is on when power is applied to the VTR

CASSETTE IN indicator. When a videocassette is in the VTR, the indicator is on.

PAUSE indicator. When a videocassette motion pauses the indicator is on.

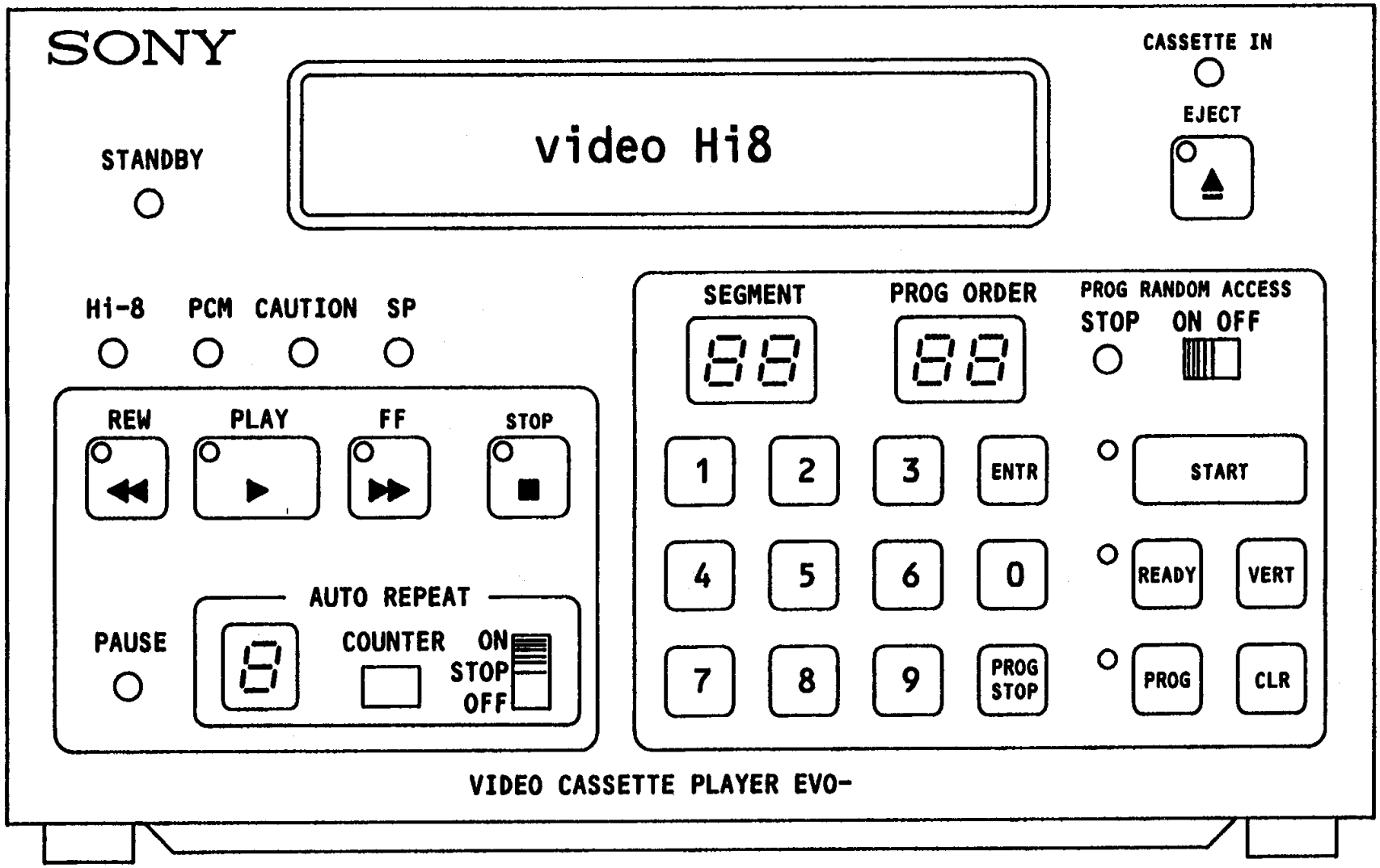

Figure 18 VIDEO TAPE REPRODUCER

SIXTEEN-INCH VIDEO MONITOR

Purpose

The sixteen-inch video monitor shows video from the video source set at the VSCU.

Features

Each sixteen-inch monitor has these side panel controls:

- Vertical hold knob to align image on the monitor screen
- Brightness control knob to adjust the brightness of image
- Hue (tint) knob to adjust one color intensity relative to other colors
- Color control knob to adjust all colors
- Pix knob to adjust for sharp image

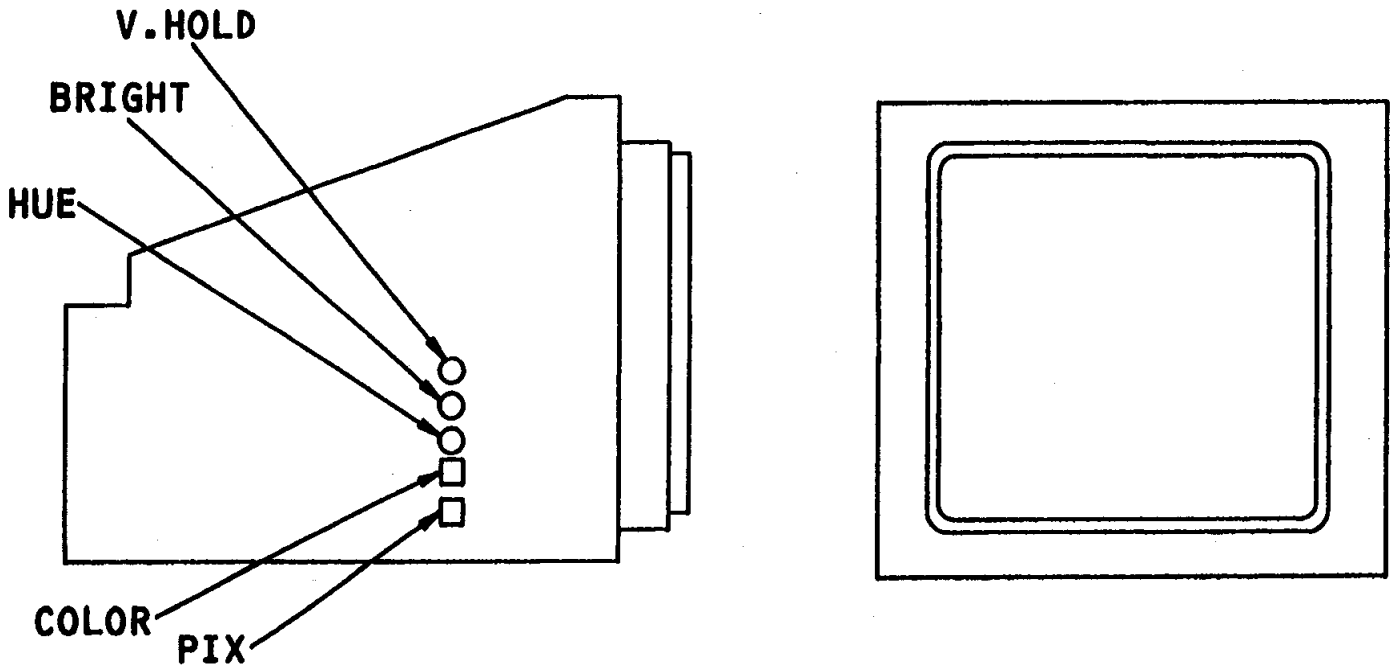

Figure 19 SIXTEEN-INCH VIDEO MONITOR

VIDEO PROJECTOR

Purpose

The video projector provides a wide video image on a reflective screen.

Features

Each video projector contains these features:

- Red, green, and blue color guns to project the video image through converging lenses on the screen.
- Convergence adjustments which are set at installation to provide the best picture quality.
- HUE control to adjust one color intensity related to others.
- COLOR control to adjust level of all the colors
- BRIGHT control to adjust picture brightness
- SHARP control to adjust picture clarity
- PICTURE control to adjust contrast level
- HATCH switch to project test pattern for convergence adjustments.

Access And Removal

To access the video projector:

- Reach into the lens openings on the front of the projector and release the finger latches that hold the shroud in place.
- Remove the lanyards and the shroud will come down, then there is access to the rear latch that holds the shroud.
- Release this rear latch to remove the shroud. The electrical connector can then be removed.
- To remove the projector, remove the quick-release bullet-pin and slide projector aft.
-

WARNING: PROJECTOR IS HEAVY AND REQUIRES TWO MECHANICS FOR REMOVAL. INJURY TO PERSONNEL CAN RESULT IF REMOVAL IS DONE ALONE.

CAUTION: SUPPORT PROJECTOR BEFORE THE PIN IS REMOVED. PROJECTOR CAN BE DAMAGED IF NOT CORRECTLY HELD.

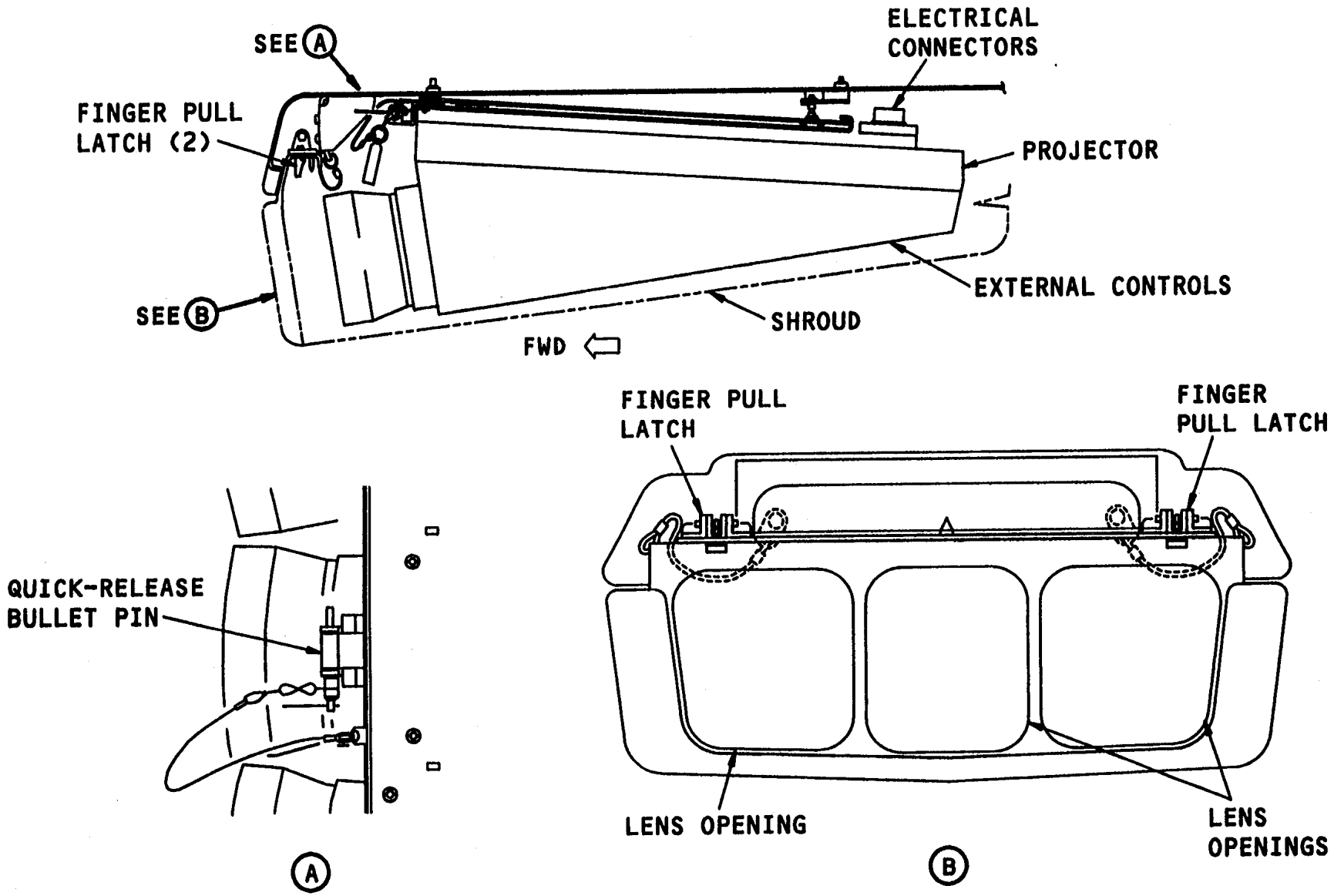

Figure 20 VIDEO PROJECTOR

8.6-INCH LCD VIDEO MONITOR

General

The 8.6-inch LCD video monitor shows video from the video source set on the VSCU.

The 8.6-inch LCD monitor has pressure switches to adjust the brightness of the LCD image.

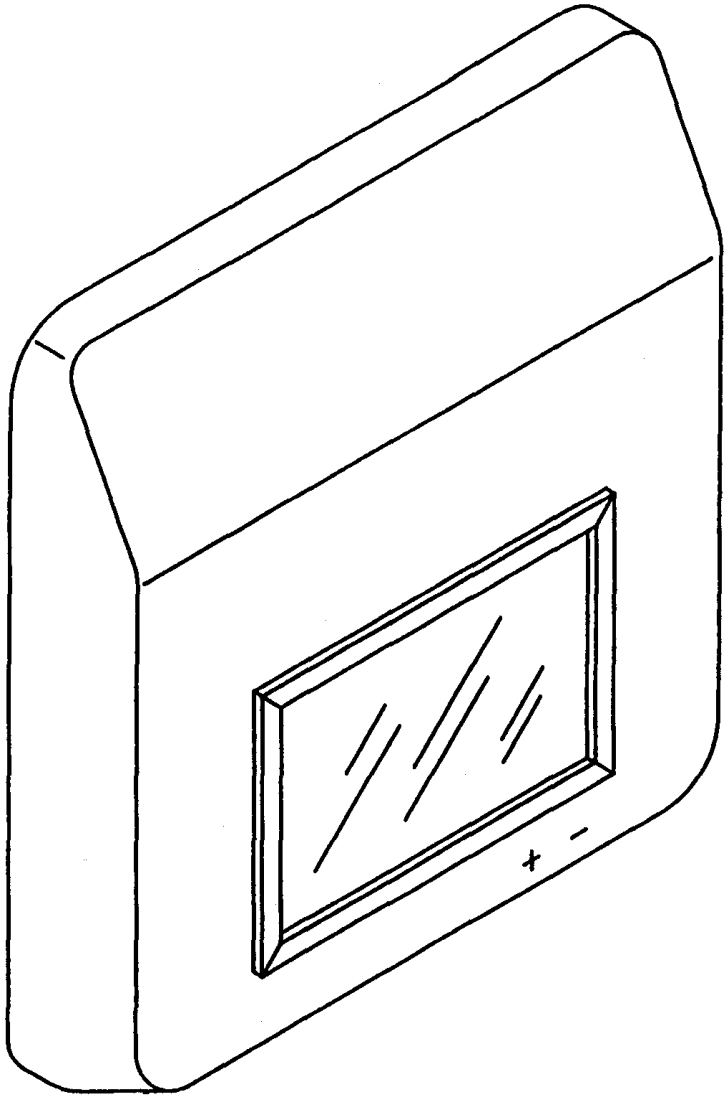

Figure 21 8.6-INCH LCD VIDEO MONITOR

AIRSHOW SYSTEM DIGITAL INTERFACE UNIT

The digital interface unit (DIU) is a software controlled unit used to produce enroute flight information which shows PES video.

The mode of operation of the DIU is selected by the mode selector switch. The mode selector switch provides discrete inputs to the DIU.

The DIU receives position and ground speed data from the left flight management computer. It also receives airspeed and temperature data from the right air data computer. The DIU formats this data according to the mode selected and the software it is programmed with. It then produces a video signal and sends it to the video system control unit.

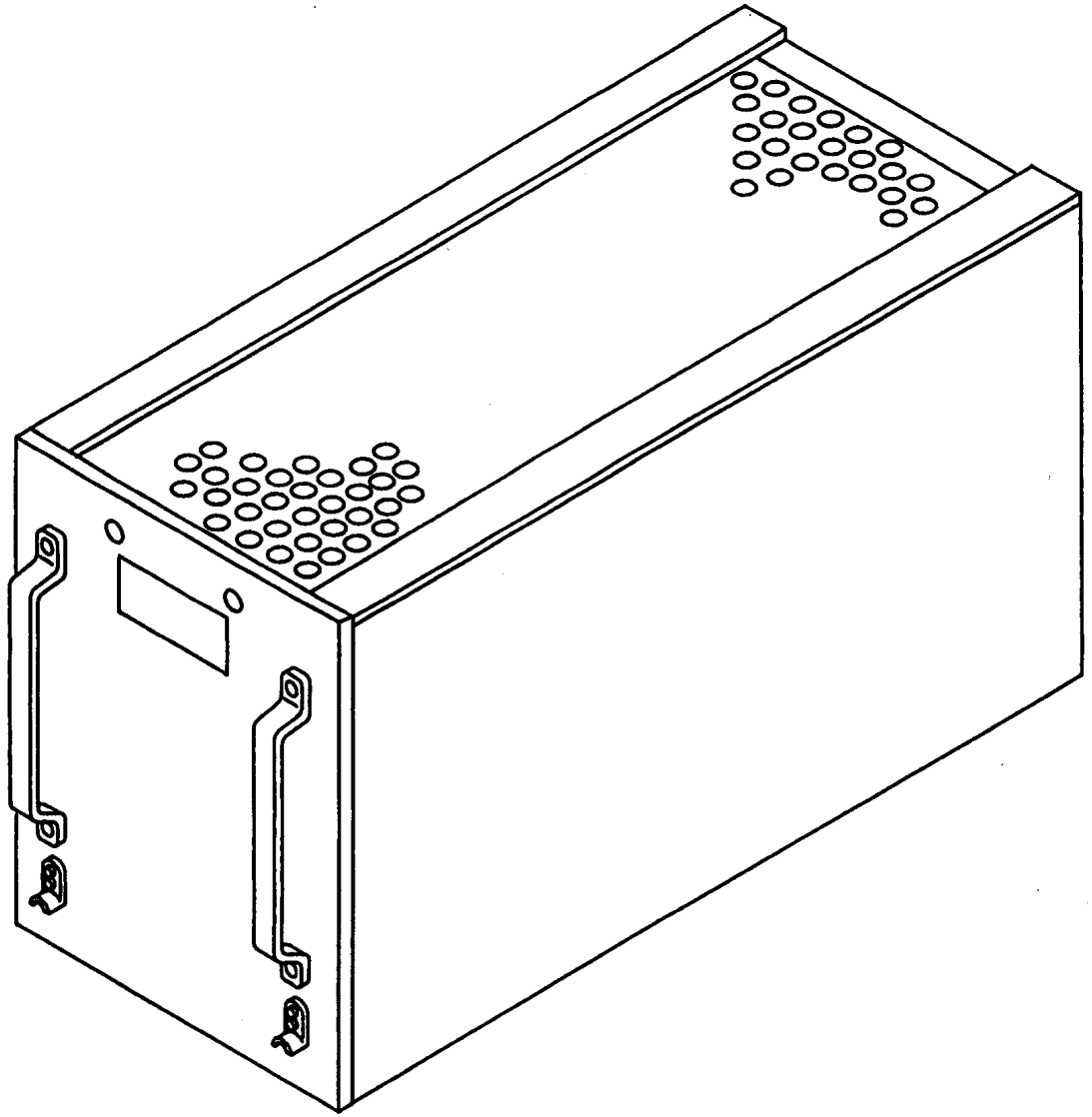

Figure 22 AIRSHOW SYSTEM DIGITAL INTERFACE UNIT

AIRSHOW SYSTEM CABIN CONTROL UNIT

The cabin control unit (CCU) is a push button activated unit that controls the AIRSHOW system.

The CCU has a LCD display and four push button indicators.

The push buttons are used to:

- Set Greenwich mean time
- Set the display modes
- Set time to destination

The CCU LCD display will show AIRSHOW control information. When no switch is pushed for three minutes the LCD display goes blank.

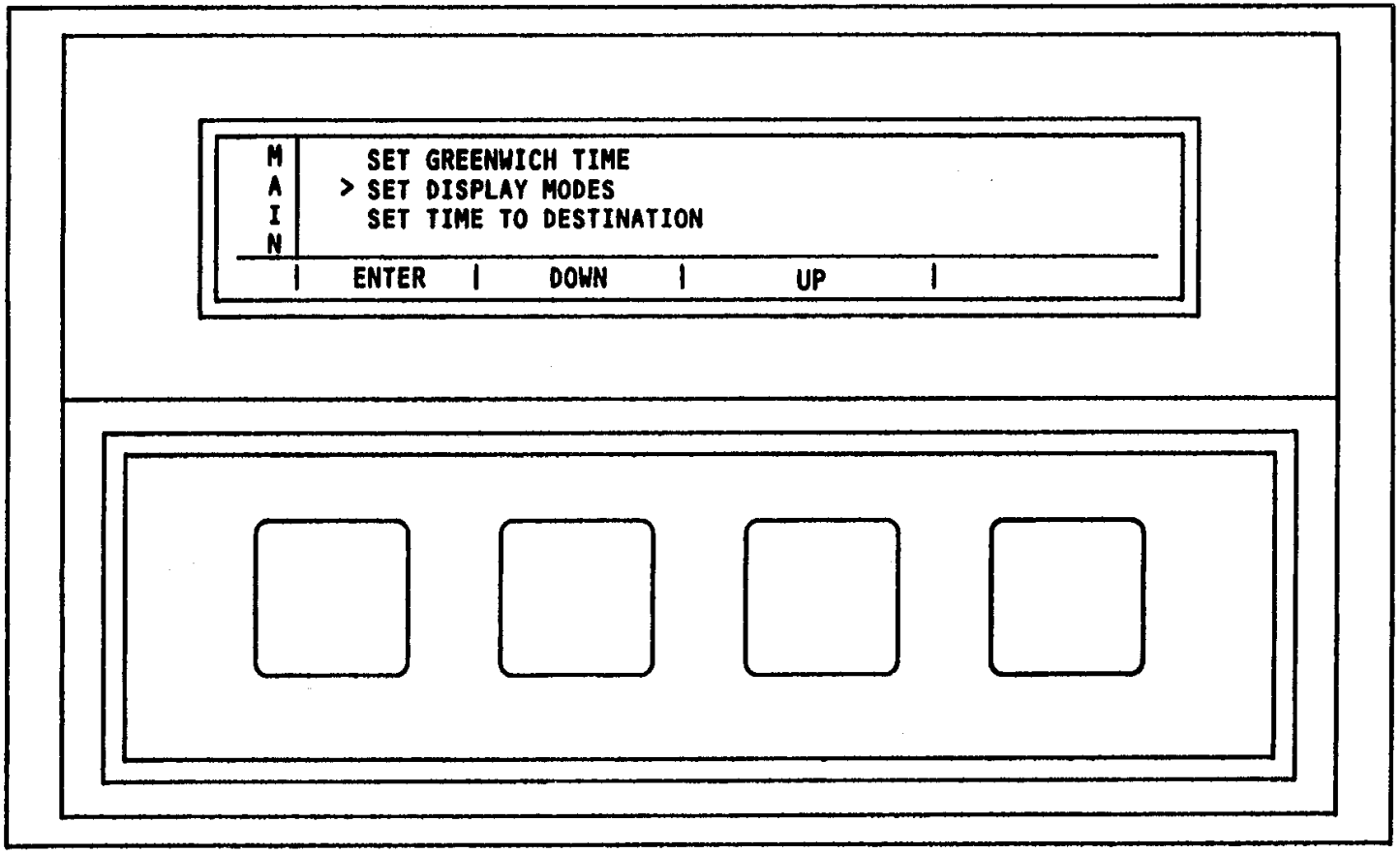

Figure 23 AIRSHOW SYSTEM CABIN CONTROL UNIT

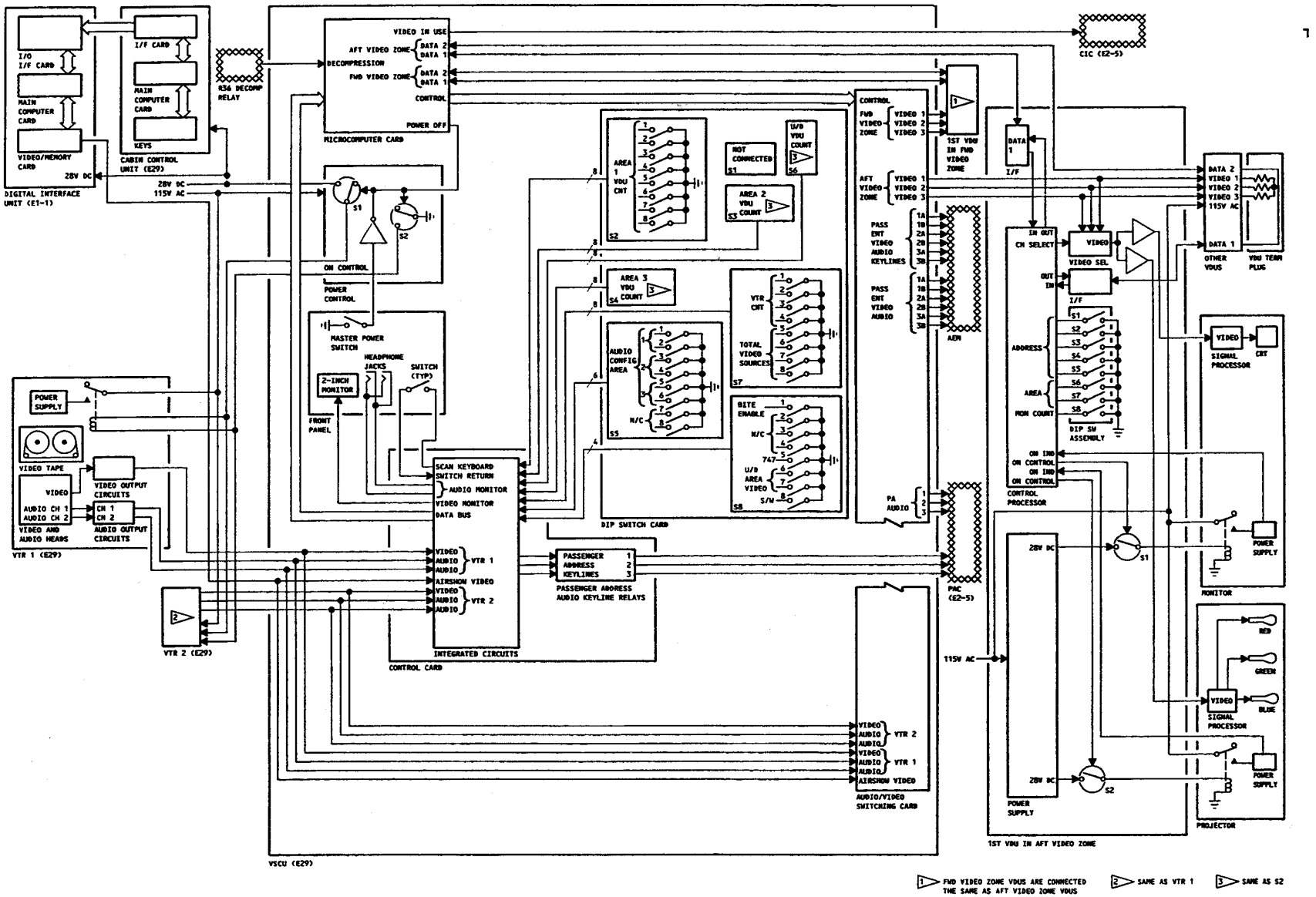

Figure 24 PES VIDEO - SCHEMATIC DIAGRAM

POWER CONTROL SCHEMATIC

General

Power for the video system components is controlled by the VSCU.

Power goes to the VTRs when the VSCU is energized. Power to the projectors and monitors is set at the VSCU and goes through the VDUs.

The VSCU sends a VIDEO IN USE discrete to the cabin interphone controller (CIC).

Decompression causes the VSCU to remove power from the video components.

VTRs

Push the master power switch, on the VSCU, to close SI and S2. SI sends 28v dc to the VTRs. S2 sends the ON CONTROL signal to the VTRs. These signals cause a relay in the VTRs to energize and apply power to the VTRs.

VDUs

The microcomputer card sends the command data set by the front panel switches to energize the projectors and monitors to the VDUs on two data lines, DATA 1 and DATA 2.

VIDEO IN USE

When power is supplied to the VSCU the microcomputer card sends a VIDEO IN USE discrete to the cabin interphone controller (CIC).

Decompression

The decompression relay sends a ground discrete to the microcomputer card during decompression. This causes the microcomputer card to send:

A POWER OFF signal to S1 and S2 in the power control circuits. The POWER OFF signal causes SI and S2 to open and remove power from the VTRs.

Commands to the VDUs to remove power from the projectors and monitors.

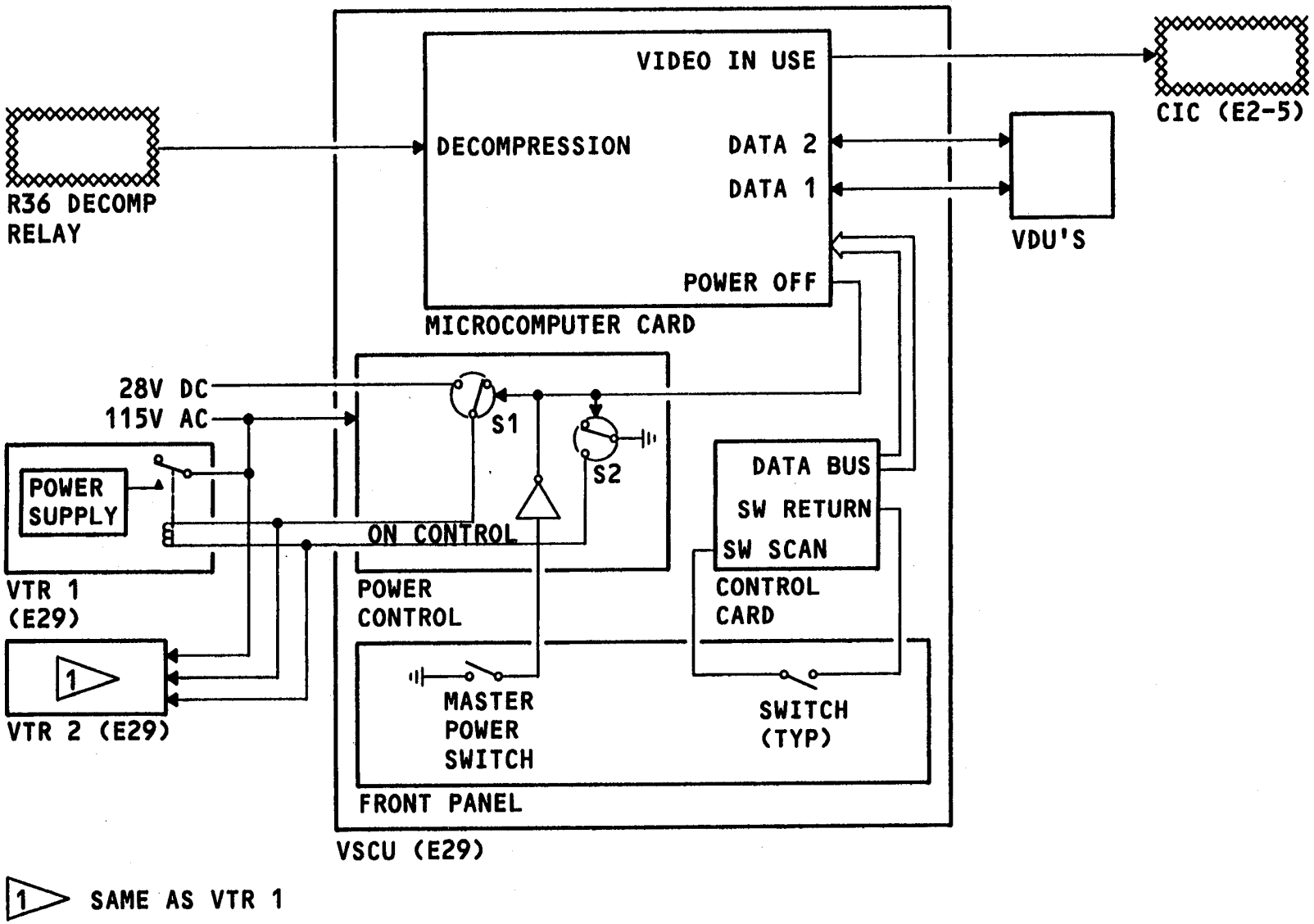

Figure 25 POWER CONTROL SCHEMATIC

VSCU CONTROL

General

The microcomputer card uses data from the control card to control the VSCU functions. The control card gets inputs from:

- Front panel switches. - Dual in-line package (DIP) switches.

DIP Switch Card

The DIP switch card sends video system configuration data to the control card.

The DIP switch card contains 8 DIP switch assemblies, each with 8 individual DIP switches.

The individual switches are slide switches. In the down position, the switch is off. In the up position, the switch is on. The switch housing shows switch position values.

Switch 1 is not connected.

Switches 2 through 41 6 and 7 are used for video configuration data.

Switch 2 sends the video area 1 VDU count to the control card.

Switch 3 sends the video area 2 VDU count to the control card.

Switch 4 sends the video area 3 VDU count to the control card.

Switch 6 sends the upper deck VDU count to the control card.

Switch 7 sends the VTR and total video source count to the control card.

Switch 8 controls several functions, they are:

- Upper deck pairing. These discretes tell the control card which area the upper deck is paired with.
- The software (SW) default discrete. This discrete tells the microcomputer card to use either, the default S/W or switches 2, 3, 4 and 6 to set the video outputs.
- The 747 discrete. This discrete tells the VSCU it is installed in a 747.
- The BITE enable discrete. This discrete must be set to do a BITE test.

Switch 5 is for audio configuration data. The four configurations for the audio are:

- Mono
- Stereo
- Dual language
- No audio

Control Card

The control card sends configuration and control data to the microcomputer card on a data bus.

Configuration data set on the DIP switches is sent from the DIP switch card to the control card. The control card multiplexes the data and sends it to the microcomputer card.

The control card scans for keyboard data, that is set on the front panel switches. A change in a switch position will cause the control card to

send the new switch position data to the microcomputer card.

The control card controls'-preview video and the associated audio to the front panel.

Microcomputer Card

The microcomputer card uses the data from the data bus to control the VSCU functions.

Audio/Video Switching Card

The audio/video switching card uses the control data from the microcomputer card to set the audio and video outputs of the VSCU.

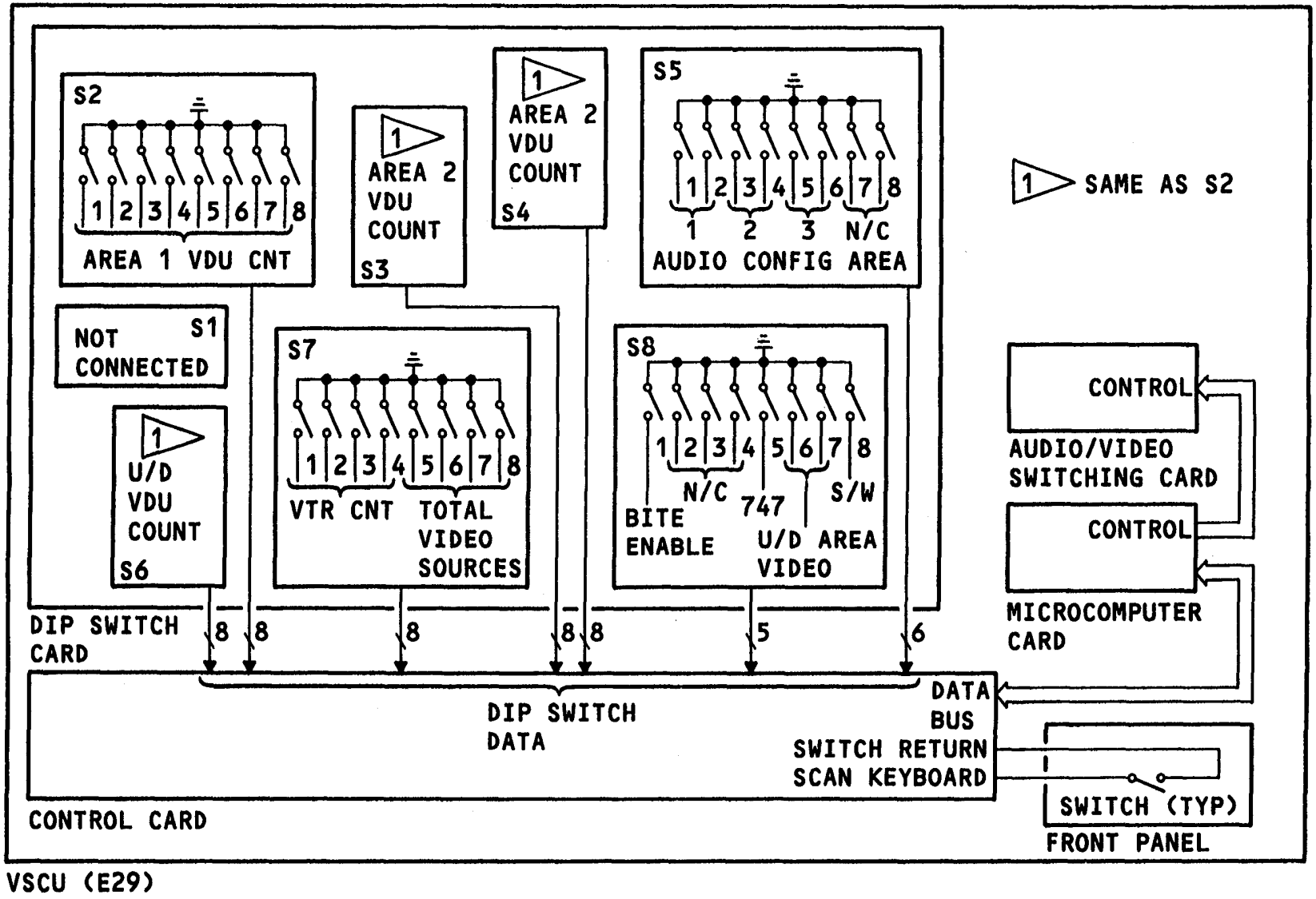

Figure 26 VSCU CONTROL

AIRSHOW SCHEMATIC

General

The AIRSHOW system digital interface unit (DIU) uses flight data, air data and information input through the cabin control unit (CCU) to create video inputs to the VSCU.

DIU

The DIU gets digital data, combines it and creates the AIRSHOW video output. The DIU has all the program information for the AIRSHOW system.

The input/output (1/0) interface card gets:

- Air data from the right air data computer (ADC)
- Flight data from the left flight management computer (FMC)
- Information and control data from the CCU

The 1/0 interface card combines the data and sends it to the main computer card.

The main computer card contains the program used to create the video in digital format. The digital video is sent to the video/memory card.

The video/memory card converts the digital video to a standard composite video signal and sends it to the VSCU.

The DIU sends video to the VSCU in four different display modes. The display modes are:

- Map. In this mode the DIU sends high resolution maps to the VSCU.
- Logo. In this mode the DIU sends the customer logo to the VSCU.
- Info. In this mode the DIU sends alphanumeric flight information to the VSCU.
- Auto. In this mode the DIU sequences through the other modes automatically.

CCU

The CCU uses the front panel keys to set the display mode and other items for the DIU.

The other items the CCU sets for DIU are:

- Time to destination
- Select destinations
- Select languages
- Set universal time constant (UTC)

The keys are menu driven.

The main computer card is used to:

- Generate the menus on the LCD display screen of the CCU.
- Send the information set on the keys to the interface (I/F) card.

The I/F card sends the data from the main computer card to the DIU.

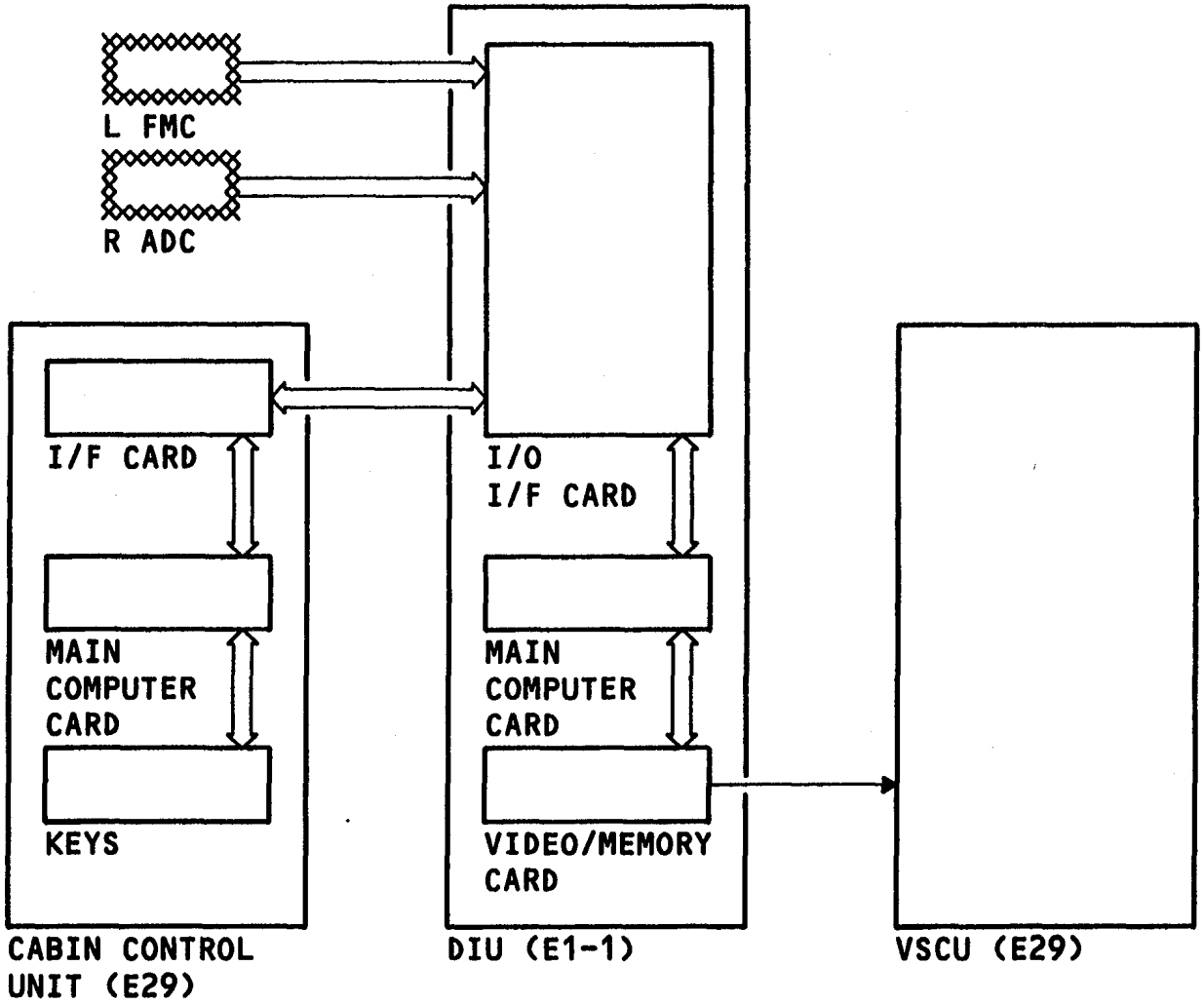

Figure 27 AIRSHOW SCHEMATIC

VIDEO AND DATA SCHEMATIC

General

The VSCU gets video from the:

- VTRs
- AIRSHOW DIU

The VSCU sends the VDUs:

- Video for distribution in the passenger cabin.
- Data to control the VDU functions.

VTRs

The video heads send the video from the video tape to the video output circuits. The video output circuits send one channel of video the VSCU.

Microprocessor

The microprocessor controls the VSCU video outputs from the audio/video switching card, with the control bus.

The microprocessor controls the VDU functions with two serial timed data signals, DATA 1 and DATA 2.

The microprocessor generates the DATA 1 and DATA 2 signals, and sends them to the first VDU in the forward and aft video zones. DATA 1 and DATA 2 contain the same data and are transmitted on a bidirectional bus. Only one data signal is active at a time.

Control Card

The control card sends preview video to the preview monitor.

The preview monitor front panel switches set the video inputs from the control card, to the monitor.

Audio/Video Switching Card

The audio/video switching card uses the video inputs to supply video signals to the forward and aft video zones.

The microprocessor controls the video outputs of the audio/video switching card through the control bus.

2-Inch Monitor

The 2-inch monitor shows preview video.

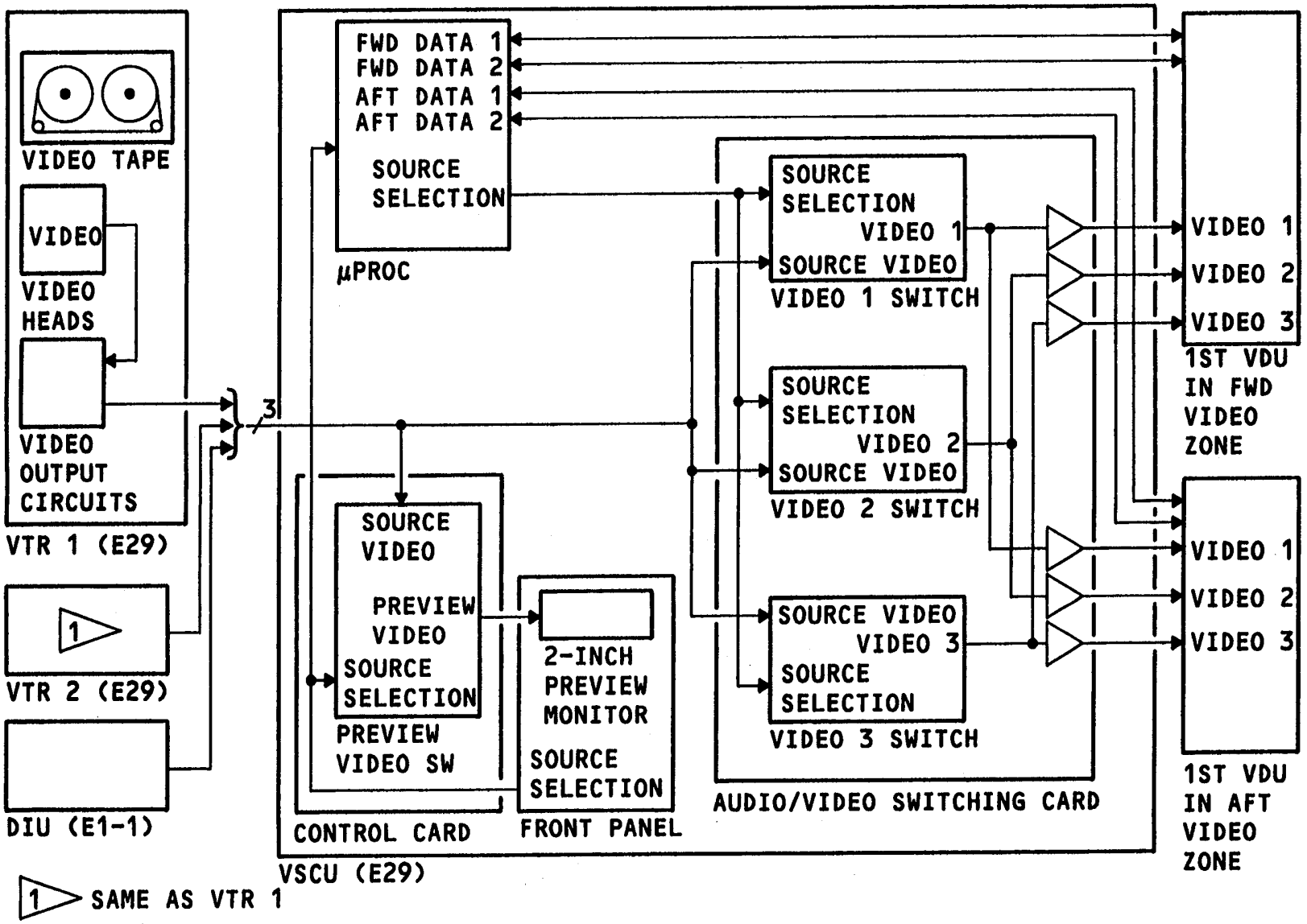

Figure 28 VIDEO AND DATA SCHEMATIC

AUDIO SCHEMATIC

General

The VTRs send audio to the VSCU. The VSCU sends the audio and key lines to:

- The PES audio, audio entertainment multiplexer (AEM).
- The passenger address system passenger address controller (PAC).

The VSCU sends audio to the front panel audio jacks.

VTRs

The audio heads send the audio from the video tape to the audio output circuits.

The VTR video tapes use three different kinds of audio programing, they are:

- Monaural. When the VTR plays a monaural tape it sends a single channel of audio to the VSCU.
- Bilingual. When the VTR plays a bilingual tape it sends one channel of audio as the primary language and one channel Of audio as the secondary language.
- Stereo. When the VTR plays a stereo tape it sends two channels of audio in stereo format.

The audio output circuits send the audio to the VSCU'.

Control Card

The control card gets audio from the VTRs. The control card uses:

- The preview monitor front panel switches to set the audio selection for the headphone jacks.
- The PA select front panel switches to set the PA audio keylines.

Audio/Video Switching Card

The audio/video switching card uses audio inputs from the VTRs to supply audio to the:

- AEM
- PAC

The microcomputer card controls the audio outputs with the control bus. The audio/video switching card uses the control data from the microcomputer card to set the audio outputs.

The audio/video switching card sends audio keylines to the AEM.

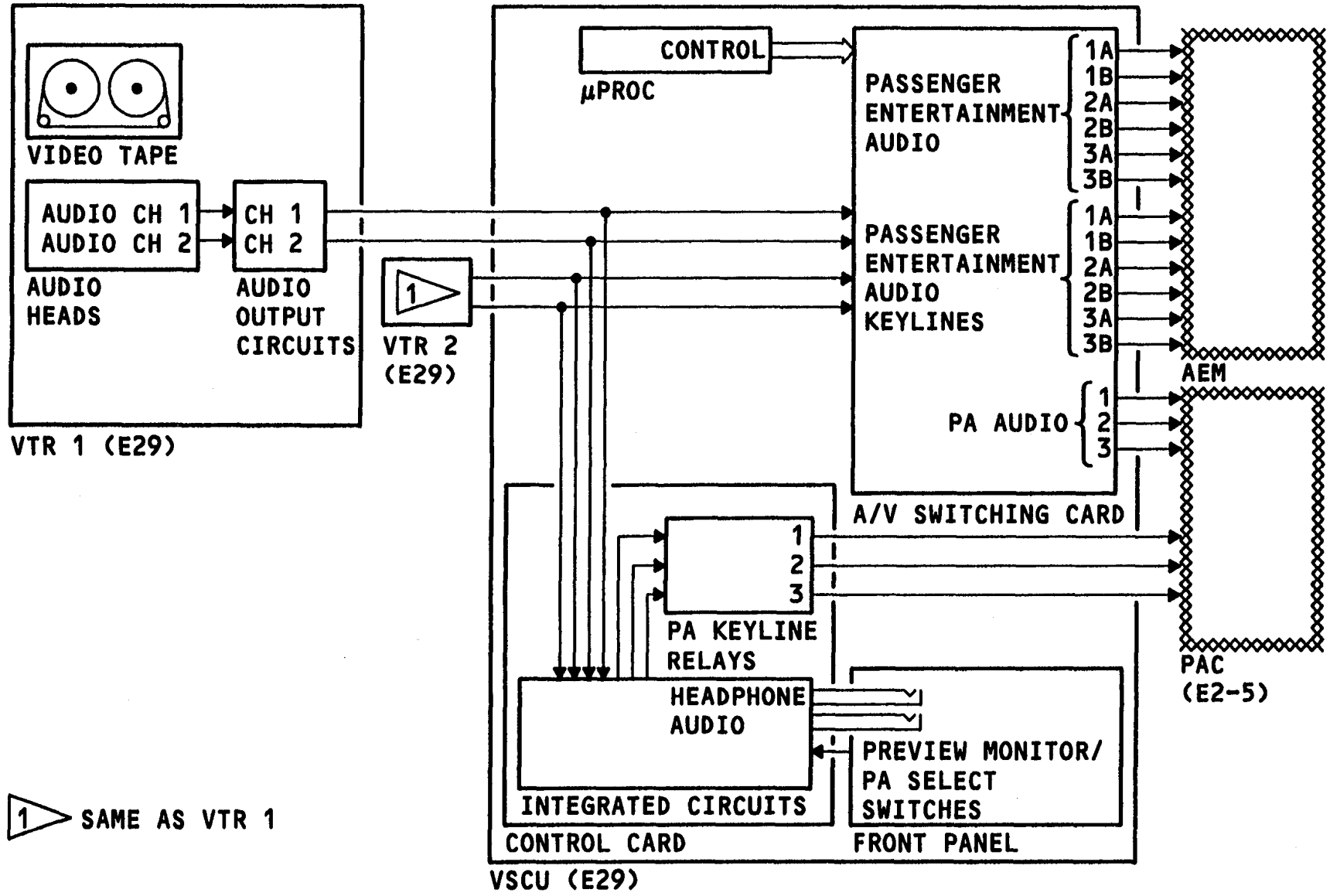

Figure 29 VSCU AUDIO SCHEMATIC

VIDEO DISTRIBUTION UNIT SCHEMATIC

General

The video distribution unit (VDU) gets data and video inputs from the VSCU or the previous VDU.

Data Processing

The VSCU sends data words on two data lines, DATA 1 and DATA 2. Only one data line is active at a time. When DATA 1 is active, the VDU gets data from the VSCU or previous VDU. When DATA 2 is active, the data goes in the opposite direction.

The VDUs get the serial timed data through two interface (I/F) circuits.

The data sent to the VDU contains:

- Command data
- Built in test equipment (BITE) test commands

The data is sent through the I/F circuit to the control processor.

The VDU has one dual in-line package (DIP) switch assembly with 8 DIP switches. Area and address data is sent from the DIP switch assembly to the control processor.

The control processor uses the DIP switch data to find its command data on the data word. The command data is removed from the data word and used in the control processor. The command data is used to:

- Energize monitors and projectors.
- Select the video channel.

During a system BITE test the VSCU sends BITE test commands to the VDUs. Each VDU does a BITE test within itself, encodes the test results and sends the results of the test to the VSCU.

Data Processing

The control processor decodes the command data and:

- Sends an ON CONTROL signal to SI and S2. This causes SI and S2 to close. SI and S2 send 28v dc to the monitor or projector. The 28v dc from the VDU energizes a relay in the monitor or projector that connects 115v ac to the monitor or projector. The power supply in the monitor or projector sends an ON INDICATION (ON IND to the VDU.
- Sends a CHANNEL SELECT (CH SELECT) signal to the video select circuit to set the video output to the projectors and monitors. The video selection circuit gets the video select signal from the control processor. The video selection circuit sets the video output, and sends it to the video amplifiers. The video amplifiers amplify and transmit video to the projectors and monitors.

Each VDU controls two monitors or one projector. The control processor sends the rest of the data word through the I/F circuit to the next VDU.

If the VDU is the last VDU in a column, only the timing portion of the data word is left. The timing portion goes through the termination plug and airframe wiring back to the VSCU.

Video Processing

The VDU gets 3 video inputs from the VSCU or the previous VDU.

The control processor uses command data to set the video output.

All three channels of video are sent to the next VDU, or a VDU termination plug if the VDU is the last one in a video zone.

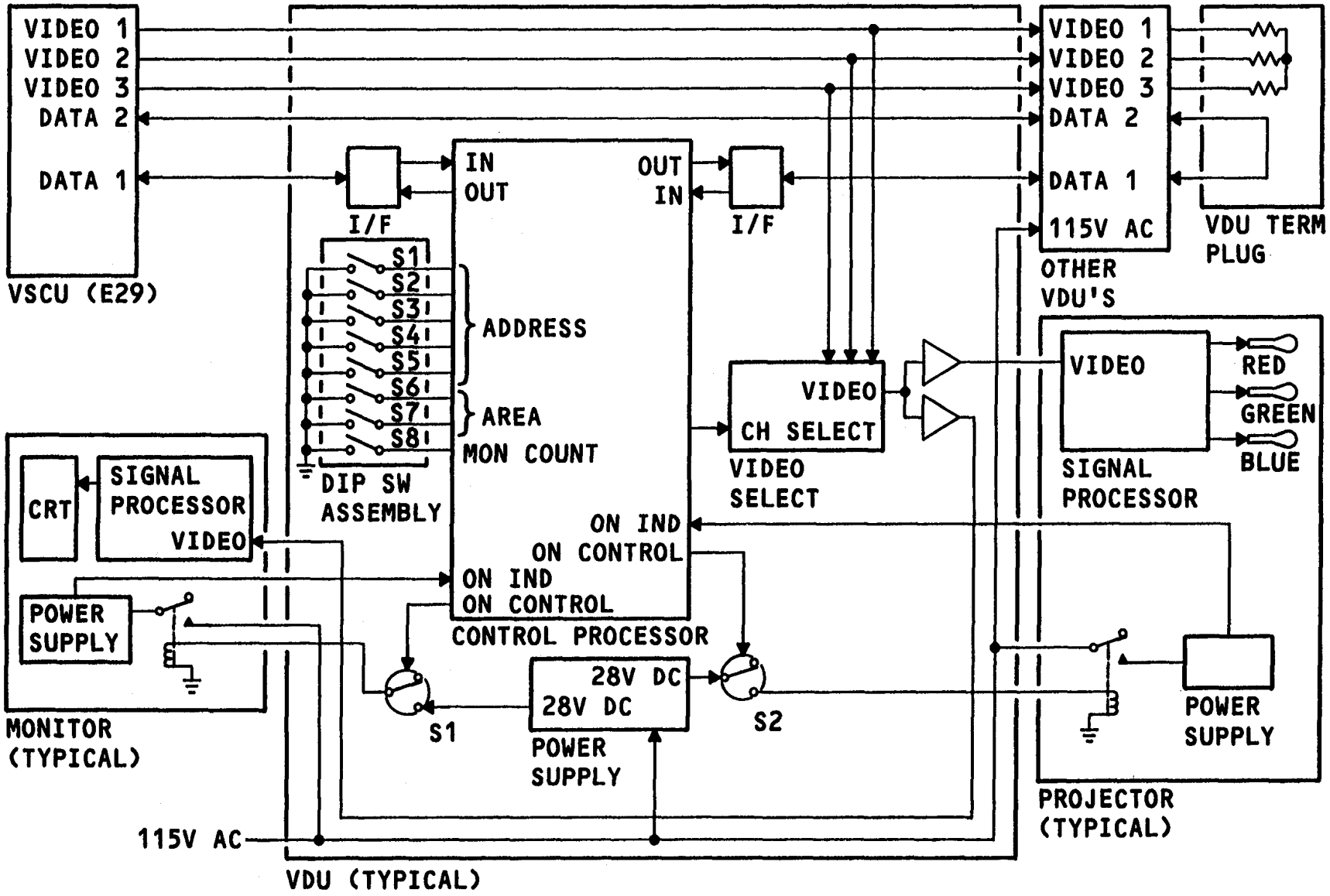

Figure 30 VIDEO DISTRIBUTION UNIT SCHEMATIC

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