PRINTING INSTRUCTIONS:

1. Pull current master copy from document control.
2. Set the copier to a light setting so the document's pictorial graphics copy legibly.
3. Copy on 20 pound copier bond.
4. Collate and staple packet at left.

05-010-9/93
INSTALLATION INSTRUCTIONS, VCR OPTION

OVERVIEW

This document contains installation procedures to install a Sony VCR, model # SVO-9500MD/4 (OEC p/n 00-900585), to the S7600 or S7700 Workstations.

The VCR Kit’s Bill of Material is on page 3. Throughout these procedures, the item numbers from the Kit’s BOM are referenced in brackets, [ ], to help identify the components. An interconnect diagram of the VCR option connections is on page 4. Installation procedures begin on page 5.

Most designations of right and left, in the text and Figures, come from a position of someone facing the rear of the Workstation (refer to Figure 1), which is the usual position for the technician when installing the VCR option components.

WARNING: Ensure that you are properly grounded to prevent ESD damage, and observe the usual safety precautions when accessing electronic components.

Required materials for installation:

- standard FS tools for installing & servicing OEC equipment
- VCR Option Upgrade Kit, Series 7600/7700, p/n 00-880932
- 7600S VCR Kit (p/o S7600/7700 VCR Option Upgrade Kit), p/n 00-452521-02; see next page

NOTE: The VCR option cable connections are shown complete in each Figure’s view; no cable is shown hanging freely or disconnected. The call-out numbers in the Figures correspond to the same-numbered steps here. The system being upgraded may differ slightly to what is pictured.
**VCR KIT**

PART NUMBER: 00-452521-02  
DESCRIPTION: KIT, VCR, 7600S

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>COMPONENT PART NUMBER</th>
<th>DESCRIPTION</th>
<th>QTY</th>
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<tr>
<td>001</td>
<td>00-451067</td>
<td>B107 VCR INTERFACE PCB</td>
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</tr>
<tr>
<td>002</td>
<td>00-452488</td>
<td>VIDEO CABLE, VCR, LONG</td>
<td>1</td>
</tr>
<tr>
<td>003</td>
<td>00-452523</td>
<td>VIDEO CABLE, VCR, SHORT</td>
<td>2</td>
</tr>
<tr>
<td>004</td>
<td>00-452524</td>
<td>VIDEO CABLE, B107-B104, W/ “T” BRANCH</td>
<td>1</td>
</tr>
<tr>
<td>005</td>
<td>00-452525</td>
<td>POWER CABLE, B107</td>
<td>1</td>
</tr>
<tr>
<td>006</td>
<td>00-452526</td>
<td>REMOTE CONTROL CABLE, VCR</td>
<td>1</td>
</tr>
<tr>
<td>007</td>
<td>00-452165</td>
<td>VIDEO CABLE, CCD CAMERA, ST9</td>
<td>1</td>
</tr>
<tr>
<td>008</td>
<td>00-903025</td>
<td>COAX CABLE CONNECTOR</td>
<td>1</td>
</tr>
<tr>
<td>009</td>
<td>00-452166</td>
<td>INTERFACE CABLE W/ “T” BRANCH</td>
<td>1</td>
</tr>
<tr>
<td>010</td>
<td>00-452167</td>
<td>TRIGGER CABLE</td>
<td>1</td>
</tr>
<tr>
<td>011</td>
<td>00-450036</td>
<td>BMS SOFTWARE (4 IC'S IN PROTECTIVE BOX)</td>
<td>1</td>
</tr>
<tr>
<td>012</td>
<td></td>
<td>PCB SNAP MOUNTS (PLASTIC STANDOFFS)</td>
<td>6</td>
</tr>
<tr>
<td>013</td>
<td></td>
<td>LENGTH OF SHRINK TUBING W/TIE-WRAP</td>
<td>1</td>
</tr>
</tbody>
</table>

NOTE: The interconnect diagram (next page) is positioned vertically on the page for clarity.
Interconnect Diagram, 7600 Series VCR Option
VCR INSTALLATION

1. Switch off the main system power. The power-off switch is located in the lower-right corner of the Workstation control panel.

2. Unplug the power cable from its AC power socket.

3. Disconnect the interconnect cable from the power panel on the rear of the Workstation.

4. If some or most of the power cord is coiled up on the rear of the Workstation, uncoil the power cord so the Workstation’s lower rear cover can be removed.

5. Remove the 10 screws (4 on the power panel, 3 on each side) from the Workstation’s lower rear cover, then remove the lower rear cover. See Figure 1.

6. Remove the 2 screws from the Workstation’s upper rear cover, then remove the upper rear cover. This gives access to the VCR compartment area where factory-installed cables (to be connected in a later step) are located. See Figure 1.
7. Install 6 snap mounts [012] to the lower rear of the Workstation shelf enclosure. See Figure 2.

8. Attach the B107 PCB [001] to the snap mounts and secure the board to the Workstation shelf enclosure. See Figure 2.

![Figure 2](image-url)
8. Disconnect the coax cable from "Video IN" on the BMS 100 frame storage box, BSA-500 panel, located on the lower left side. See Figure 3.

Figure 3
9. Connect the previously disconnected coax cable end to the new video cable [007] using the "barrel" connector [008], cover the connection with heat shrink tubing [013], then secure the connection to the lower right side of the frame using tie-wrap. See Figure 4.
10. Connect the other end of the new video cable [007] to ST9 on the B107 board, located near the lower left corner on PCB. See Figure 5.

11. Connect one end of the long coax cable [002] to ST8 on the B107 board (located in the lower left corner of the PCB), and the other end to Vin on the BSA 500 board, located in BMS 100. See Figure 5.

12. Locate the factory-installed cable connected to BMS 100, NWA-500 V1, access the cable's free (unconnected) end in the VCR compartment, then connect the free end to ST5 on the B107 board, located on the left of the PCB. (The VCR compartment is located immediately below the monitors; refer to Figure 1.) See Figure 5.

**Figure 5**

- Connect the free end of the BMS 100, NWA-500 V1 cable to ST5 on the B107 PCB.
- Connect new video cable to ST9 on B107, located near the lower left corner on the PCB.
- Connect long coax cable to ST8 on B107, located near the lower left corner on the PCB.
13. Connect one short coax cable [003] to ST7 on the B107 board (located near the lower right corner of the PCB), then label the cable as “V OUT.” See Figure 6.

14. Connect the other short coax cable [003] to ST6 on the B107 board (located on the right side of the PCB), then label the cable as “V IN.” See Figure 6.

**Figure 6**
15. Disconnect the ribbon cable from ST1 of the B104 PCB (located on the lower right side of the Workstation), then connect the video control cable [004] to ST1 on B104. See Figure 7.

16. Connect the previously disconnected ST1 ribbon cable end to the T-branch on video control cable [004]. See Figure 7.

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**Figure 7**
17. Disconnect one end of the old interface cable from ST3 on the B104 board (located on the bottom edge of the PCB) and the other end from the "Parallel Port" on BMS 100. This cable will not be re-used. See Figure 8.

18. Connect the new interface cable 009 to ST3 on the B104 board, then connect the trigger cable 010 to the new interface cable's T-branch. See Figure 8.

Figure 8
19. Route the trigger cable [010] to the B107 board, then connect the trigger cable to ST2 on B107, located on the right of the PCB. See Figure 9.

20. Route the video control cable [004] to the B107 board, then connect the video control cable to ST4 on B107, located on the top edge of the PCB, toward the left. See Figure 9.
21. Route the new interface cable [009] around to the front of BMS 100, then connect the cable to "Parallel Port" on BMS 100. See Figure 10.
22. Connect the appropriate end of the power cable [005] to ST1 on the B107 board, located near the upper left corner of the PCB. See Figure 11.

Figure 11
23. Connect the other end of the power cable (with the two exposed wire ends) to the terminal block:

- blue wire to block # 5
- brown wire to block # 6

See Figure 12.
24. Connect the VCR remote control cable [006] to ST3 on the B107 board, located in the upper right on the PCB. See Figure 13.

25. Route the other end of the VCR remote control cable [006] up to the inside of the VCR compartment.
NOTE: Steps 26, 27, & 28 are non-applicable for a 7700 system. If upgrading a 7700 system, skip to step 29.

26. Remove the mtg. screw(s) that attach the CPU-100 board to BMS 100, then remove the CPU-100 board. (This is the left-most board on BMS 100 in the view shown below.) See Figure 14.
27. Remove the 4 old IC SW chips from the CPU board, then install the new ICs [011] to the CPU board into the same sockets as the ones removed. See Figure 15.

28. Reinstall the CPU board back into BMS 100.

29. Fit the Sony VCR into the VCR compartment from the front of the Workstation, connect the VCR’s video cables, then plug in the VCR’s AC power cable.

30. Reinstall the Workstation upper rear and lower rear covers, reconnect the interconnect and power cables, then test the system for proper operation.
Camera Alignment for Series 7700 CCD Camera

Necessary Test tools:

- Oscilloscope
- DVM
- Dosimeter
- 25mm AL Block
- 1.5mm Cu
- Grayscale tool
- Resolution tool

ATTENTION: DO NOT adjust pots 3, 4, 26, 28, 29, 35, or 36

Before starting adjustments:

- All measurements should be done with a 10:1 divider
- Check Dipswitches (S1 – S3) for correct settings (see figure 2 for correct positions)
- Check jumper setting for operation mode = position 1. (see figure 3)
- Connect the oszilloscope to the video output connector on the CCD PCB

1. Saturation Adjustment (see figure 3 for potentiometer location):

Mode: Fluoro/kV-Auto

Fluoro with object in beam and measure voltage delta on ST 19 (1V=10% saturation). Now adjust P 34 for 20% (+5%) CCD saturation.

2. Dose Pre-adjustment (see figure 1):

Mode: Fluoro/kV-Auto

Place 25mm AL block and 1.5mm Cu on Generator and make mechanical iris adjustment to approximately 76 kV under fluoro.

3. Focus Adjustment (see figure 1):

Mode: Fluoro/kV-Auto

Place Resolution tool on I.I. and adjust the aluminum ring at the Optic for best resolution. Tighten the hex setscrew.
4. Camera Position (Mechanical) (see figure 1):

Mode: Fluoro/kV-Auto

Loosen the 3 mounting screws and adjust H-position/V-position by moving the Camera until it is in center and tighten the mounting screws.

5. ABC-Gain (see figure 3 for potentiometer location):

Adjust P 42 to the left limit (page 4).

6. Auto Circle Adjustment (see figure 3 for potentiometer location):

Mode: Fluoro/kV-Auto

To show circle set dipswitch S3/3 to OFF
Adjust circle size to 9 cm (+/- 0.5 cm) with P 28 if necessary (or 15 micro seconds at the video connector on the CCD PCB).
Circle contrast P 24
Circle shape P 27
Circle position P 8 (Horizontal), P 7 (Vertical)

Turn off the circle with switching S3/3 to ON position

7. AGC Offset (see figure 3 for potentiometer location):

Mode: Fluoro/kV-Auto

Place grayscale in the center of the beam
Adjust P 37 that all gray steps are visible at the oscilloscope.
Black level 75 mV (+ 20 mV)
White shall not be at the limit (no cut-off) 1000mVss (+ 100 mV)

8. Vignetting (see figure 3 for potentiometer location):

Mode: Fluoro/ kV-Auto

Place 2mm copper filter on Monoblock and fluoro adjust P 17 (H-Tilt), P 20 (H-Dome), P 11 (V-Tilt), P 14 (V-Dome)
9. Video Offset (see figure 3 for potentiometer location):

Mode: Fluoro/kV-Auto
Object in the beam

Adjust **P 23** to Videobaseline (one line between 1. and 2. Sync pulse that is only separated by the video).

10. Dose Adjustment (see figure 1 & figure 3):

Mode: Fluoro/kV-Auto
25 mm Al and 1,5 mm Cu in the beam

Place the measurement chamber on the X Ray Grid close to the Image Intensifier. Be aware to place a chip detector at a position outside of the autocircle circle (could effect the dose regulation if it is placed in the circle).

Adjust now the Dose with mechanical iris adjustment to 0,500 micro Gy/sec. (+0,02 micro Gy/sec.).
Adjust ½ Dose (Low Dose Modus) with **P 33** to half the Dose adjusted before – to 0,250 micro Gy/sec. (+0,02 micro Gy/sec.).

**Grid Decrease**

If you adjusted the dose to the upper values you would measure at the entrance window of the Image Intensifier following dose rates:

- 0.500 microGy/s / 1,45 = 0.34microGy/sec
- 0.250 microGy/s / 1,45 = 0.17microGy/sec

Re-Check Focus, AGC offset and Saturation and re-adjust if necessary.

11. Amplitude Matching (see figure 3 for potentiometer location):

With **P 41** line attenuation’s in the system (SERIES systems) can be compensated without changing other parameters.
Figure 1

Mounting Screws
H & V Adjustment

Set-Screw for Iris Adjustment

Iris Adjustment

Focus Adjustment
Figure 2

Pins on Camera Analog Board