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Manual 4052M1019 Obsession Upgrade Installation Instructions

Table of Contents

Introduction	1
ECO Synopsis.....	1
Obsession Full Console Upgrade Kit (4052S1018).....	4
Face Panel Button Board (4052B5004)	4
Submaster Pot. Board (4052B5005 and 4052B5027)	5
Switches (4052B7010 and 4052B7011).....	6
Obsession Serf Board (4052B5011)	7
Serf board revision D & E	8
Serf board revision C	11
DC Power Supply wiring.....	12
Required testing	12
Obsession Remote Console Upgrade Kit (4052S1019).....	14
Node Board (4052B5014)	14
Face Panel Button Board (4052B5004)	16
Submaster Pot. Board (4052B5005 and 4052B5027)	17
Switches (4052B7010 and 4052B7011).....	18
DC Power Supply wiring.....	18
Required testing	19
Obsession RPU Upgrade Kit (4052S1015)	20
Obsession Serf Board (4052B5011)	20
Serf board revision D & E	21
Serf board revision C	24
DMX Connector Board (4052B4029)	25
Power Distribution Board (4052B5028).....	25
Required testing	26
Obsession Remote Interface Upgrade Kit (4052S1016)	27
Node Board (4052B5014)	27
DC Power Supply wiring.....	28
Required testing	29
Obsession Remote Video Interface Upgrade Kit (4052S1017).....	30
RVI CPU Board (4053B5001)	30
DC Power Supply wiring.....	31
Required testing	32
Obsession RPU Power Supply Upgrade Kit (4052S1020).....	33
Required testing	34
Upgrade Registration (photocopy master).....	37

Introduction

There have been numerous Engineering Change Orders (ECOs) made to the Obsession product line since its introduction. These changes have been to address random field failures or to improve performance in both current and previous production models. All relevant ECOs have been compiled into six, all-inclusive upgrade packages. These include an upgrade to the power supply in previous production RPUs.

This document will outline these changes, the parts required, and procedures to implement them according to equipment type. The tools required for these modifications are the normal field service tool kit plus some form of wire retainer adhesive¹. Once modifications have been performed, all equipment should be thoroughly tested to ensure full functionality. A test procedure or specific tests will be included in each section as required. At the completion of testing, the software may be upgraded to the most recent version.

Note: Use full anti-static precautions during the following procedures to prevent ESD damage to PC boards and components. This includes the use of anti-static mats, grounded wrist straps, and all other normal precautions.

Some modifications or part changes may have been done previously. If this is the case, verify the modification or part change was done correctly. The modification or part change does not need to be done again.

ECO Synopsis

ECO # Problem: Changes

- 1571 *Noise on DMX switcher line:* add a 1000 pF capacitor on Serf boards from the DMX switcher control line to ground at U78 (revision C) or U44 (revision D). This filters noise on the DMX control line to prevent driving the output to change state. This modification applies to revision C and D Serf boards only and is not required for revision E and subsequent revisions.
- 1915 *Power ON checksum errors of battery back-up memory:* change GAL programming of U27 and add the ISA bus reset signal to one of the GAL pins. This added the ISA reset term to the equations for memory write so the memories were disabled during reset. This ECO was removed by ECO 1977 and ECO 2096.
- 1942 *Face panel synchronization errors:* add a resistor pull-up package to the console face panel button board. This pulls up the mythical bus data lines from the submaster board(s) and internal to the button board. They no longer float when not driven during single bit reads. The floating inputs could cause noise to be injected into adjacent signals at the output of the bus buffer.
- 1943 *Face panel synchronization errors:* ground a floating input on the submaster potentiometer board. This prevents a floating input from amplifying noise and injecting it into adjacent data lines. This can occur while reading the front panel button board FIFO empty flag through the submaster board and cause the flag to be misread.
- 1944 *DMX switcher changes state without command:* change a 74LS04 inverter on the power distribution board to a 74HC14. The LS part was marginal for driving the input LED to the opto-couplers over time and temperature. The HC part offers more current drive in the current circuit configuration and better noise immunity.
- 1945 *DMX switcher changes state without command:* change a 74LS259 addressable latch on the Serf board to a 74HC259. This provides buffered outputs which can't be forced to an alternate state by noise on the output lines. The previous LS part could have its output forced to an alternate state by noise and would remain in this state.
- 1948 *ETCNet errors:* remove capacitors from the thin-net shield to digital ground on the Serf board and left the capacitors to chassis ground. This eliminates the noise picked up on the thin-net shield from being injected into digital ground and causing random errors.

¹Wire adhesive may be Loctite® TAK PAK (444 instant adhesive and 7452 accelerator) or hot-melt glue.

- 1949 *ETCNet errors: remove capacitors from the thin-net shield to digital ground on the Node board and left the capacitors to chassis ground. This eliminates the noise picked up on the thin-net shield from being injected into digital ground and causing random errors.*
- 1950 *RAMDAC failures: add ground wire from chassis ground to DC return close to the power supply to eliminate a floating DC supply in consoles and RPU. This prevents static voltage build-up between the RAMDAC outputs and monitor inputs if the monitor is plugged in with the system running.*
- 1956 *Go switch failures: change to a more reliable switch and change a pull-up resistor package on the face panel button board. This is to improve field failure rate of the GO switch in consoles. The new switch has better contact life specifications and the change in resistor values increases the current through the switch contacts to further reduce the failure rate.*
- 1957 *RAMDAC failures: remove paint inside the chassis at shielded D-subminiature connectors. This ensures good chassis ground connection to the shield of the connectors on the painted surfaces of consoles, RPUs, and RVIs to prevent floating shield connections. The shield is the first connection made when the monitor is plugged in. A grounded shield will discharge any built up static charge safely to chassis ground.*
- 1968 *Power ON checksum errors of show memory: add a 0.01 μ F capacitor across the ISA bus reset signal and ground as it enters the Serf board. This filters out induced noise spikes on the signal which could cause intermittent failures. This ECO was integrated into ECO 2096.*
- 1977 *Power ON checksum errors of show memory: add diodes to the battery back-up voltage switches on the Serf board. This prevents any access to the show and shared memories until the ISA and 1960 reset signals have timed out and the power supply voltage has risen high enough for the processors to stabilize. This ECO was integrated into ECO 2096.*
- 1998 *ETCNet errors: change sequencing in Ethernet hardware interface PALs. this changes the bus timing to the Ethernet circuit on Serf boards, Node boards, and RVI CPU boards. The new timing adds hold time after read or write to the Ethernet chip. The new timing eliminates the majority of reported ETCNet errors.*
- 2042 *DMX noise: cut the digital ground returns on the DMX output connectors and connect them to chassis ground. This prevents noise from the DMX cable shield from being injected into digital ground on the Serf board and causing random errors.*
- 2096 *Aggregate ECO: This ECO combined previous ECOs which had not been fully implemented in production. Add a 0.01 μ F capacitor to the ISA bus reset signal as it enters the Serf board. This filters out induced noise on the reset signal which can cause random failures. Add diodes to the battery back-up memory voltage switches on the Serf board. This prevents memory overwrites to the show and/or shared memory data while the CPU and Serf board are booting up. These would corrupt show and/or shared memory data during boot-up and cause this data to be cleared.*
- 2102 *Remote Video Interface ETCNet errors: remove capacitors from the thin-net shield to digital ground and left the capacitors to chassis ground. This eliminates noise picked up on the thin-net shield from being injected into digital ground and causing random errors.*
- 2106 *ETCNet address read errors: change U68 on the Node board from GAL to a TI PAL. Noise on the clock line can cause metastability of the GAL part. The alternate part doesn't recognize the noise. This shows up as misreading the ETCNet address allowing a node to log onto the system with a false address.*
- 2206 *Power supply high failure rate: change the 50 watt power supply to an 80 watt model. The 50 watt power supply was run at its peak output during normal operation. This lead to a high failure rate in the field. The new supply has a higher power output so is run below its maximum output during normal operation.*
- 2294 *RPU restricted cooling air flow: change the current metal mesh air filter to a metal finger guard. The air is discharged through the filter. It can load up with dust over time if not cleaned regularly. This restricts the cooling air flow and causes elevated internal temperatures in the RPU.*
- 2302 *Serf board Echelon Failure: add a resistor pull-up package to the Serf board at U55. This pulls up the BD bus data lines so they no longer float during single bit reads. The floating inputs cause noise to be injected into adjacent data lines. Also, the Echelon chip has insufficient drive when reading the status register without the pull-up.*
- 2370 *Face panel synchronization errors in remote consoles: added a resistor pull-up to the BD0-7 data lines on the Node board. The resistor pull-up eliminates the bus float between accesses which can inject noise into adjacent data lines.*
- 2371 *Change boot EPROM to allow for future expansion: change the boot EPROM to Flash EEPROM*

on all Node and RVI CPU boards so it can be updated from disk during future software upgrades. This allows upgrades to the boot code without changing hardware.

Note: These ECO numbers are referenced by footnotes during the following procedures. This is to assist in identifying changes associated with specific ECOs.

Obsession Full Console Upgrade Kit (4052S1018)

This modification kit will upgrade the face Panel board, Submaster boards, Serf board, and DC power supply harness in Obsession full consoles. The following are the parts required for this modification:

Part number	Quantity	Description	ECO reference
4052A3104	3	SPACER .625 x .950 0.090 Al	1956
4052B7094	2	DIODE ASSEMBLY	2096
4052B7009	2	OBSESSION BLACKOUT/STOP CBL	1956
4052B7010	1	OBSESSION GO SWITCH CBL	1956
C105	1	CAP .01MF 100V .2" CERM	2096
C155	1	CAP 1000PF 50V 10% .2" DISC	1571
C168	1	CAP 10MF 20V 10% .1" TANT	2096
CR116	2	ZENER 500MW 5% 4.3V 1N5229b	2096
I204	5	LABEL .8"X.25" PAL	2205
J427	2	TERM RING #6 22-18AWG RED	1950
PAL1005B	1	SERF U36 7EE2 09/27/93 22V10	2096
PAL1015A	1	SERF U85 AC84 06/18/96 22V10	1998
PAL1052	1	SERF U27 7F62 10/14/93 22V10	2096
PAL1056A	1	SERF U40 8BEB 06/18/96 22V10	1998
R262	1	RES/SIP 2.2K 10P 9R	1956
R316	2	RES/SIP 4.7K 10P 9R	1942, 2302
W106	6"	WIRE 30GA GREEN 125C KYNAR	1942, 1943, 2096
W329	36"	WIRE 18GA 300V 105C GRN/YEL	1950
W609	6"	HEATSHRINK 1/16 BLK FIT221V	1956
Z190	1	IC 74HC259 8 ADRSBLE	1945

The following are the installation instructions for this modification:

Face Panel Button Board (4052B5004)

This modification adds resistor pull-ups to the BD data lines and changes another pull-up package to increase the current through the GO and STOP/BACK switches. When the FIFO empty flag is read through the local port, only bit zero is active and the rest of the bits float. This injects noise into the active bit and can cause it to be misread. The resistor pull-up for the GO and STOP/BACK switches is changed to a lower value to ensure sufficient current through the contacts.

This procedure is intended to modify revision D or higher face panel button boards only. If the system contains a previous revision board, contact ETC Technical Services for a replacement.

Note: Refer to Figure 1 during the following procedure.

1. Turn power OFF to the console and wait until it has cycled down.
2. Unplug the power cord from the power entry module.
3. Remove the LIVE, BLIND, GROUP, and SUB keycaps from the face panel button board.
4. Open the console for service.
5. Unplug all cables and harnesses from the face panel button board.
6. Remove the mounting screws and remove the board from the console.
7. Modify the board on the component side as follows¹:
 - a. Cut pin 2 off of the 4.7K resistor pack (part R316).
 - b. Prepare the resistor pack for installation by soldering a short piece of W106 wire onto the resistor pack pin 1.
 - c. Stand the resistor pack beside U1 with pin 10 of the resistor pack at pin 9 of U1. The pin 1 end of the resistor pack should project past the end of U1.

¹ ECO 1942

- d. Solder the pins of the resistor pack to the legs of U1 at pins 2 through 9.
 - e. Solder the short piece of W106 wire from pin 1 of the resistor pack to U1 pin 20.
 - f. Remove the resistor pack RP1 and replace with the 2.2K resistor pack (part R262)².
8. Reinstall the face panel button board.
 9. Reconnect all cables and harnesses which were previously removed.
 10. Reinstall the LIVE, BLIND, GROUP, and SUB keycaps on the face panel button board.
 11. Enter today's date on one of the ECO labels (part I204) and affix it to the PC board.

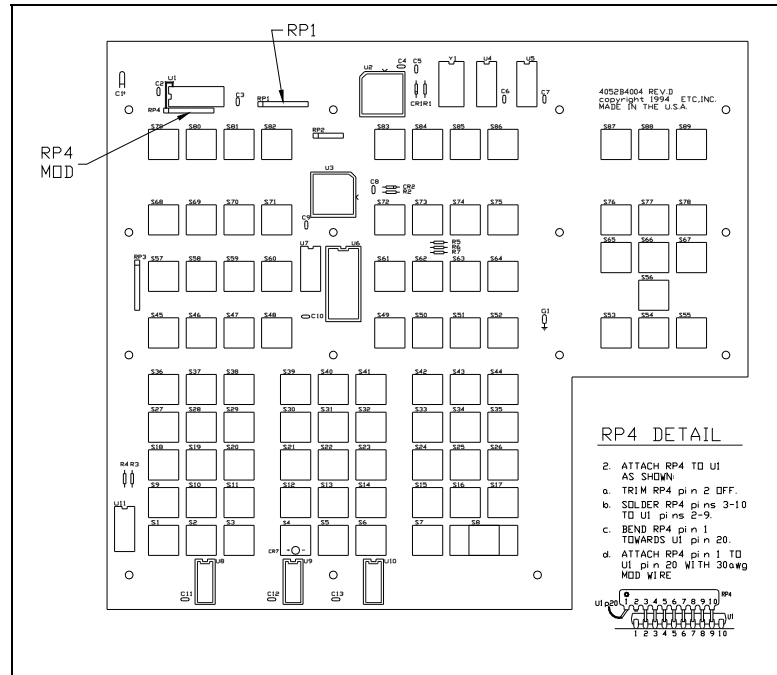


Figure 1

Submaster Pot. Board (4052B5005 and 4052B5027)

This modification grounds a floating bus buffer input. The face panel FIFO empty flag is read on this port along with the submaster bump buttons. The floating input injects enough noise into adjacent data lines to cause the flag and/or bump buttons to be misread. This procedure is performed on the boards without removing them from the console.

Note: Refer to Figure 2 during the following procedure when modifying 4052B5005 boards. These boards are identified by round bump buttons and one LED above each keycap. The board is shown inverted as it will appear when the console is opened for service.

1. Ensure power is OFF to the console.
2. Connect U4 pin 17 to U4 pin 10 with W106 wire on the solder side of the board³.
3. Perform the previous steps for the second submaster board if one is installed.
4. Enter today's date on one of the ECO labels (part I204) and affix it to the PC board.

² ECO 1956

³ ECO 1943

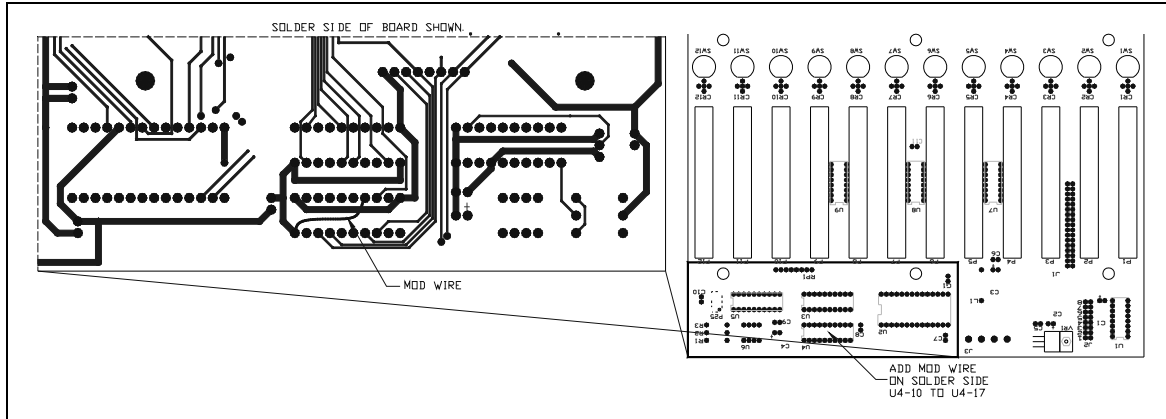


Figure 2

Note: Refer to Figure 3 during the following procedure when modifying 4052B5027 boards. These boards are identified by square bump buttons and two LED's in the keycap. The board is shown inverted as it will appear when the console is opened for service.

1. Ensure power is OFF to the console.
2. Connect U2 pin 17 to U2 pin 10 with W106 wire on the solder side of the board⁴.
3. Perform the previous steps on the second submaster board if one is installed.
4. Enter today's date on one of the ECO labels (part I204) and affix it to the PC board.

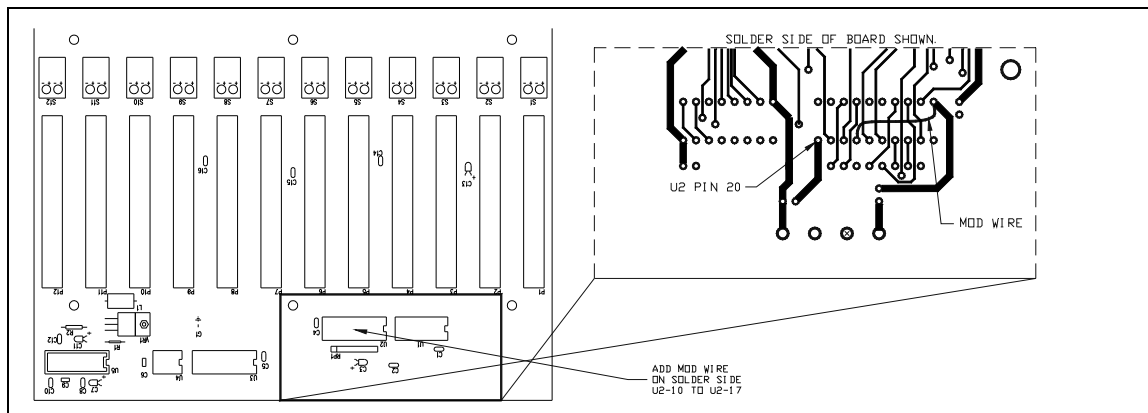


Figure 3

Switches (4052B7010 and 4052B7011)

This modification replaces the current GO, STOP/BACK, and BLACKOUT switches with a more reliable part. The previous switches had shown an unacceptable failure rate in test and in the field. This modification *must* be performed in conjunction with modifications to the face panel button board as described previously.

Note: Some older models of Obsession consoles mounted the GO and STOP/BACK switches directly in the console face panel ribs and not on a separate mounting plate. Ignore those instructions which refer to the mounting plate if they do not apply.

⁴ ECO 1943

1. Ensure power is OFF to the console.
2. Unplug the GO and STOP/BACK switches from the face panel button board. Note the wire colors from each switch and the connection point.
3. Remove the four screws holding the switch mounting plate to the face panel and remove the switch plate and switches from the console.
4. Remove the switches from the plate. Note the location of the switches.
5. Remove the switch nuts and button caps from the new switch assemblies.
6. Install switch spacers (part 4052A3104) on a new GO switch (part 4052B7010 with violet wires) and STOP/BACK switch (part 4052B7009 with gray wires)⁵.
7. Install the new switches and spacers into the switch plate with the switch nuts.
8. Replace the button caps on the switches.
9. Connect the switches to the face panel button board.
10. Reinstall the switch plate into the console. Ensure the switch buttons are aligned in the openings before tightening the screws.
11. Unplug the BLACKOUT switch from the fader switch board.
12. Remove the switch from the fader switch board.
13. Remove the switch nut and button cap from the new switch assembly.
14. Install switch spacers (part 4052A3104) on new a BLACKOUT (part 4052B7009 with gray wires)⁶.
15. Install the new switch and spacer into the fader switch board with the switch nut.
16. Replace the button caps on the switch.
17. Connect the switch to the fader switch board.

Obsession Serf Board (4052B5011)

This modification performs the following modifications to the Serf board:

- Add a 0.01 μ F capacitor to the /RESET line to filter noise spikes that cause memory corruption and random errors.
- Add the low-true reset signal from the I960 reset generator to the base of the show memory power fail sense transistor through a diode. This prevents the memory enable until after the I960 reset has timed out. The memory cannot be accessed during this time.
- Add the ISA bus reset signal, after buffering, to the base of the show memory power fail sense transistor through a diode. This prevents the memory enable until the ISA bus reset has timed out. The memory cannot be accessed during this time.
- Change the zener diodes in both battery backup switches to disable the memories until the +5 volt supply has risen to a high enough level to allow the reset signals to stabilize.
- Change the I960 reset time capacitor to shorten the over-long reset time.
- Remove capacitors from the thin-net shield to digital ground. This reduces the noise injected into digital ground.
- Change the ethernet chip interface PAL to correct timing which caused intermittent failures.
- Add a resistor pull-up package to the BD data lines. This puts floating data lines to a known state during single bit reads to reduce noise.
- Change a 74LS259 latch to 74HC259 to prevent noise on the output line from changing the state of the DMX switcher selection.

⁵ ECO 1956

⁶ ECO 1956

- Add a 1000 pF capacitor to the DMX control line to help prevent noise on the output line from changing the state of the output on revision C and D boards only.

Note: Different changes are required according to the revision level of the board. The following sections detail the changes for each case.

Serf board revision D & E

Note: Refer to Figure 5 and Figure 6 during modifications to the revision D and later Serf boards.

1. Ensure power is OFF to the console.
2. Remove the attaching hardware from the rear panel connectors of the Serf and Optional I/O boards. Retain the hardware for later reinstallation.
3. Unplug the power harness and any other cables connected to the Serf board.
4. If the Optional I/O board is installed, perform the following steps:
 - a. Disconnect the ribbon cable at the Serf board connector.
 - b. Remove the four mounting screws and remove the Optional I/O board.
 - c. Remove the mounting screws for the Optional I/O mounting bracket and remove the bracket.
5. Remove the mounting screws and standoffs for the Serf board and remove the board from the chassis.
6. Modify the board as follows:
 - a. If U27 1052A is present, remove it and install U27 1052⁷.
 - b. Remove U40 1056 and install U40 1056A⁸.
 - c. If there is a 30 AWG mod wire running from U27 pin 3 to either J8 pin A2 or U3 pin 12 on the solder side of the board, remove it.
 - d. If a mod wire was removed in the previous step, reconnect U27 pin 3 to the feed-through it was originally connected to. Use 30 AWG mod wire (part W106) for this purpose⁹.
 - e. Install a 0.01 μ F capacitor (part C105) on the solder side of the board between J8 pins A2 and B1. Use a drop of wire adhesive to secure the body of the capacitor to the board.
 - f. Solder the anode lead of one of the diode assemblies (part 4052B7094) to the center base lead of Q2.
 - g. Solder the flying lead to U3 pin 11. Use wire adhesive to secure the wire and diode body to the board.
 - h. Solder the anode lead of one of the diode assemblies (part 4052B7094) to the center base lead of Q8.
 - i. Solder the flying lead to U41 pin 5. Use wire adhesive to secure the wire and diode body to the board.
 - j. Remove CR19 and CR22 and replace them with 1N5229B zener diodes (part CR116).
 - k. Remove C134 and replace it with a 10 μ F/20 volt tantalum capacitor (part C168).
 - l. Remove U44 and install a 74HC259 (part Z190)¹⁰.
 - m. Locate C30 and C31 close to the thin-net BNC and remove them from the board¹¹. Refer to Figure 4 while installing the resistor pack to U55¹².

⁷ ECO 2096

⁸ ECO 1998

⁹ ECO 2096

¹⁰ ECO 1945

¹¹ ECO 1948

¹² ECO 2302

- n. Cut pin 2 off of the resistor pack (part R316).
 - o. Stand the resistor pack beside U55 on the pin 11 to 20 side of the IC. Orient the resistor pack with pin 1 of the resistor pack at U55 pin 20.
 - p. Solder the resistor pack to the pins of the IC.
The following two steps apply to revision D Serf boards ONLY¹³.
 - q. Bend the pins of the 1000 pF disc capacitor (part C155) to fit between pins 12 and 8 of U44 with the capacitor body lying flat on top of the IC.
 - r. Solder the capacitor leads to U44 at pins 12 and 8.
 - s. Enter today's date on one of the ECO labels (part I204) and affix it to the PC board.
7. Remove the paint from the inside of the console around the shielded D-subminiature connectors to the size of the connectors. Use a sharp screwdriver, sandpaper, or other instrument as desired¹⁴.
 8. Thoroughly clean the inside of the chassis in the area of the Serf board to remove all metal filings and debris.
 9. Replace the Serf board into the chassis and reinstall the mounting screws and standoffs to hold it in place.
 10. Replace the external mounting hardware for the Serf board connectors.
 11. Reinstall the Optional I/O mounting bracket and board.
 12. Replace the external mounting hardware for the Optional I/O board.
 13. Reconnect all cables and harnesses which were previously removed.

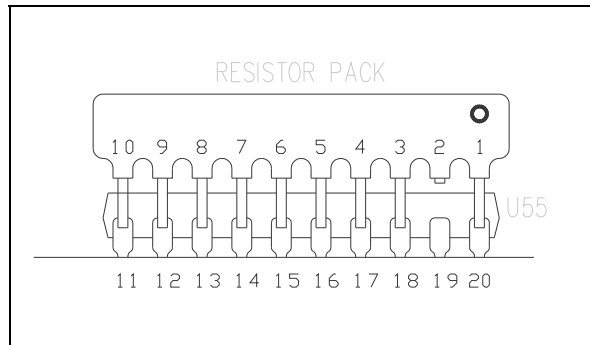


Figure 4

¹³ ECO 1571

¹⁴ ECO 1957

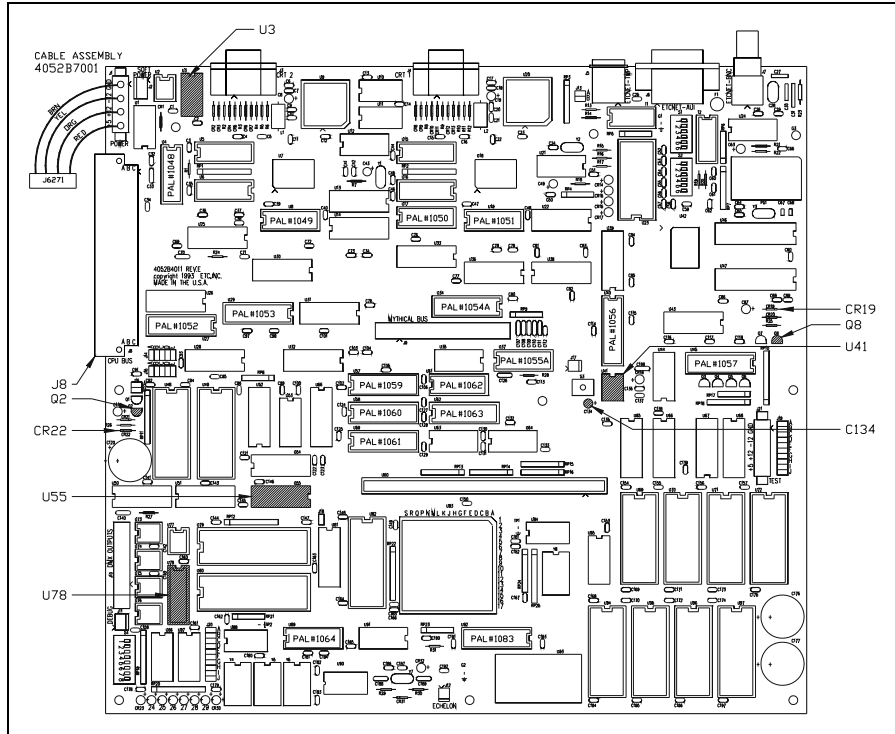


Figure 5

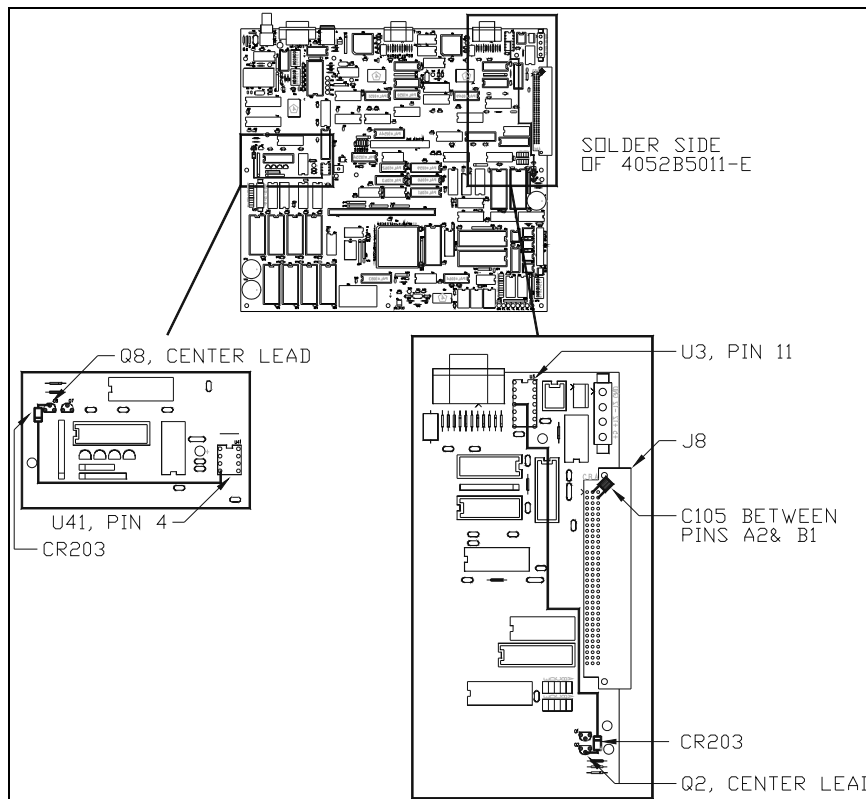


Figure 6

Serf board revision C

1. Turn power OFF to the console.
2. Unplug the power cord from the power entry module.
3. Remove the attaching hardware from the rear panel connectors of the Serf and Optional I/O boards. Retain the hardware for later reinstallation.
4. Unplug the power harness and any other cables connected to the Serf board.
5. If the Optional I/O board is installed, perform the following steps:
 - a. Disconnect the ribbon cable at the Serf board connector.
 - b. Remove the four mounting screws and remove the Optional I/O board.
 - c. Remove the mounting screws for the Optional I/O mounting bracket and remove the bracket.
6. Remove the mounting screws and standoffs for the Serf board and remove the board from the chassis.
7. Modify the board as follows:
 - a. If U36 1005C is present, remove it and install U36 1005B¹⁵.
 - b. Remove U85 1015 and install U85 1015A¹⁶.
 - c. If there is a 30 AWG mod wire running from U36 pin 3 to either J8 pin A2 or U3 pin 12 on the solder side of the board, remove it.
 - d. If a mod wire was removed in the previous step, reconnect U36 pin 3 to the feed-through it was originally connected to. Use 30 AWG mod wire (part W106) for this purpose¹⁷.
 - e. Install a 0.01 μ F capacitor (part C105) on the solder side of the board between J2 pins A2 and B1. Use a drop of wire adhesive to secure the body of the capacitor to the board.
 - f. Solder the anode lead of one of the diode assemblies (part 4052B7094) to the center base lead of Q2.
 - g. Solder the flying lead to U3 pin 11. Use wire adhesive to secure the wire and diode body to the board.
 - h. Solder the anode lead of one of the diode assemblies (part 4052B7094) to the center base lead of Q4.
 - i. Solder the flying lead to U41 pin 5. Use wire adhesive to secure the wire and diode body to the board.
 - j. Remove CR19 and CR31 and replace them with 1N5229B zener diodes (part CR116).
 - k. Remove C170 and replace it with a 10 μ F/20 volt tantalum capacitor (part C168).
 - l. Remove U78 and install a 74HC259 (part Z190)¹⁸.
 - m. Locate C76 and C77 close to the thin-net BNC and remove them from the board. Refer to Figure 4 while installing the resistor pack to U55.
 - n. Cut pin 2 off of the resistor pack (part R316)¹⁹.
 - o. Stand the resistor pack beside U55 on the pin 11 to 20 side of the IC. Orient the resistor pack with pin 1 of the resistor pack at U55 pin 20.
 - p. Solder the resistor pack to the pins of the IC.
 - q. Bend the pins of the 1000 pF disc capacitor (part C155) to fit between pins 12 and 8 of U78 with the capacitor body lying flat on top of the IC²⁰.

¹⁵ ECO 2096

¹⁶ ECO 1998

¹⁷ ECO 2096

¹⁸ ECO 1945

¹⁹ ECO 2302

²⁰ ECO 1571

- r. Solder the capacitor leads to U78 pins 12 and 8.
 - s. Enter today's date on one of the ECO labels (part I204) and affix it to the PC board.
8. Remove the paint from the inside of the console around the shielded D-subminiature connectors to the size of the connectors. Use a sharp screwdriver, sandpaper, or other instrument as desired²¹.
 9. Thoroughly clean the inside of the chassis in the area of the Serf board to remove all metal filings and debris.
 10. Replace the Serf board into the chassis and reinstall the mounting screws and standoffs to hold it in place.
 11. Replace the external mounting hardware for the Serf board connectors.
 12. Reinstall the Optional I/O mounting bracket and board.
 13. Replace the external mounting hardware for the Optional I/O board.
 14. Reconnect all cables and harnesses which were previously removed.

DC Power Supply wiring

1. Strip one end of the 18 AWG ground wire (part W329) and crimp on a #6 ring tongue terminal (part J427)²².
2. Remove one of the screws on the DC return terminals of the power distribution terminal strip. These should have only *brown* wires connected to the terminals.
3. Install the new ground wire and reconnect the screw removed in the previous step.
4. Route the new ground wire to the area close to the AC power entry module and locate the chassis ground stud. This should be the first connection to chassis from the power entry module.
5. Cut the new ground wire to length, strip it, and crimp on another #6 ring tongue terminal.
6. Remove the top nut from the chassis ground stud, install the new ground wire, and reinstall the nut.

Required Testing

1. Enable message and event logging with the maximum verbose level.
2. Verify that the keyboard keys function correctly.
3. Bring up the diagnostic screen and verify that the bump buttons and submaster potentiometers function correctly.
4. Verify all console functions perform correctly as follows:
 - a. All DMX ports function.
 - b. All Video outputs function.
 - c. ETCLink functions.
 - d. MIDI/SMPTE function.
 - e. RFU functions.
5. Perform ETCNet loop test from this console to all nodes in the system for a minimum of 100,000 passes. If this cannot be done, perform the loop test for as many times as practicable in the available time.
6. At the end of the ETCNet loop test, check the diagnostics and loop test screens for errors. The allowed errors are as follows:

ETCNet loop test:	1 reported error per node
Error 699: Keyboard sync problems	1 reported per console

²¹ ECO 1957

²² ECO 1950

7. Affix the ECO label (part I204) to the rear of the console close to the serial number label. It should be visible when viewing the serial and model numbers.
8. Complete and return the upgrade registration forms.

Obsession Remote Console Upgrade Kit (4052S1019)

This modification kit will upgrade the face panel button board, submaster boards, node board, and DC power supply harness in Obsession Remote Consoles. The following are the parts required for this modification:

Part number	Quantity	Description	ECO reference
4052A3104	3	SPACER .625 x .950 0.090 Al	1956
4052B7009	2	OBSESSION BLACKOUT/STOP CBL	1956
4052B7010	1	OBSESSION GO CBL	1956
I204	5	LABEL .8"X.25" PAL	2205
J427	2	TERM RING #6 22-18AWG RED	1950
PAL1024	1	NODE U68 D114 06/21/93 22V10	2106
PAL1025B	1	NODE U75 4D2B 06/18/96 22V10	1998
R262	1	RES/SIP 2.2K 10P 9R	1956
R316	2	RES/SIP 4.7K 10P 9R	1942, 2370
W106	6"	WIRE 30GA GREEN 125C KYNAR	1942, 1943
W329	36"	WIRE 18GA 300V 105C GRN/YEL	1950
Z537	1	IC 29F010-120 FLASH DIP32	2371

The following are the installation instructions for this modification:

Node Board (4052B5014)

This modification changes PALs on the Node board and makes other changes which increase the reliability of the board.

Note: Refer to Figure 8 during the following procedure.

1. Ensure power is OFF to the console.
2. Remove the attaching hardware from the rear panel connectors of the Node board. Retain the hardware for later reinstallation.
3. Unplug the power harness and any other cables connected to the Node board.
4. Remove the mounting screws and standoffs for the Node board and remove the board from the chassis.
5. Remove the paint from the inside of the console around the shielded D-subminiature connectors to the size of the connectors. Use a sharp screwdriver, sandpaper, or other instrument as desired¹.
6. Thoroughly clean the inside of the chassis in the area of the Serf board to remove all metal filings and debris.
7. Remove U75 1025A and install U75 1025B².
8. Locate C78 and C79 close to the thin-net BNC and remove them from the board³.
9. Locate U68 and lift the label to identify the manufacturer of the part.
 - a. If U68 is not a TI part, replace it with U68 (part PAL1024) from the parts kit⁴.
 - b. Discard the old GAL.
10. Remove the EPROM from U34 (part Z254) and replace it with the Flash EEPROM (part Z537)⁵.

¹ ECO 1957

² ECO 1998

³ ECO 1949~~8~~

⁴ ECO 2106

⁵ ECO 2371

11. Install a resistor pull-up pack to U58 as follows⁶:
 - a. Refer to Figure 7 during the following procedure.
 - b. Cut pin 2 off of the 4.7K resistor pack (part R316).
 - c. Stand the resistor pack beside U58 with pin 1 of the resistor pack at pin 20 of U58.
 - d. Solder the pins of the resistor pack to the legs of U58 at pins 11 through 18 and pin 20.
12. Replace the Node board into the chassis and reinstall the mounting screws and standoffs to hold it in place.
13. Replace the external mounting hardware for the Node board connectors.
14. Reconnect all cables and harnesses which were previously removed.
15. Enter today's date on one of the ECO labels (part I204) and affix it to the PC board.

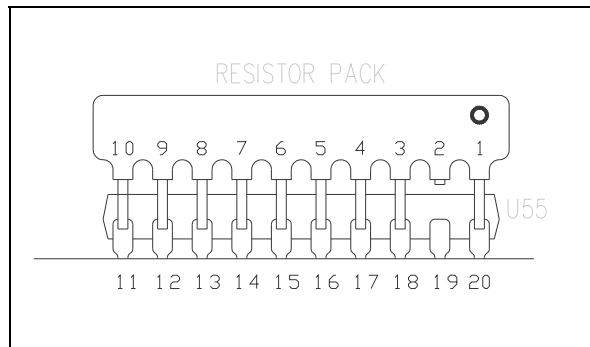


Figure 7

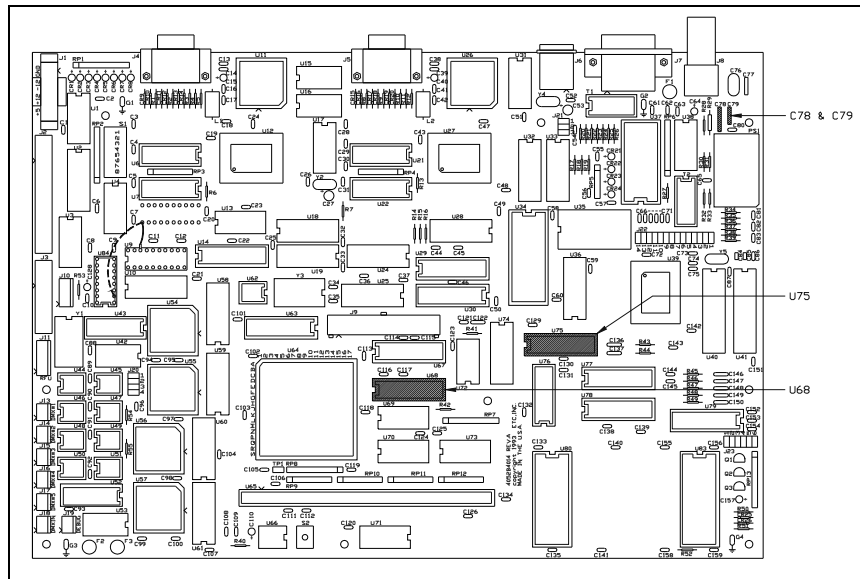


Figure 8

⁶ ECO 2370

Face Panel Button Board (4052B5004)

This modification adds resistor pull-ups to the BD data lines and changes another pull-up package to increase the current through the GO and STOP/BACK switches. When the FIFO empty flag is read through the local port, only bit zero is active and the rest of the bits float. This injects noise into the active bit and can cause it to be misread. The resistor pull-up for the GO and STOP/BACK switches is changed to a lower value to assure sufficient current through the contacts.

This procedure is intended to modify revision D or higher face panel button boards only. If the system contains a previous revision board, contact ETC Technical Service for a replacement.

Note: Refer to Figure 9 during the following procedure.

1. Turn power OFF to the console and wait until it has cycled down.
2. Unplug the power cord from the power entry module.
3. Remove the LIVE, BLIND, GROUP, and SUB keycaps from the face panel button board.
4. Open the console for service.
5. Unplug all cables and harnesses from the face panel button board.
6. Remove the mounting screws and remove the board from the console.
7. Modify the board on the component side as follows⁷:
 - a. Cut pin 2 off of the 4.7K resistor pack (part R316).
 - b. Solder a short piece of W106 wire onto the resistor pack pin 1.
 - c. Stand the resistor pack beside U1 with pin 10 of the resistor pack at pin 9 of U1. The pin 1 end of the resistor pack should project past the end of U1.
 - d. Solder the pins of the resistor pack to the legs of U1 at pins 2 through 9.
 - e. Solder the short piece of W106 wire from pin 1 of the resistor pack to U1 pin 20.
 - f. Remove the resistor pack RP1 and replace with the 2.2K resistor pack (part R262)⁸.
8. Reinstall the face panel button board.
9. Reconnect all cables and harnesses which were previously removed.
10. Reinstall the LIVE, BLIND, GROUP, and SUB keycaps on the face panel button board.
11. Enter today's date on one of the ECO labels (part I204) and affix it to the PC board.

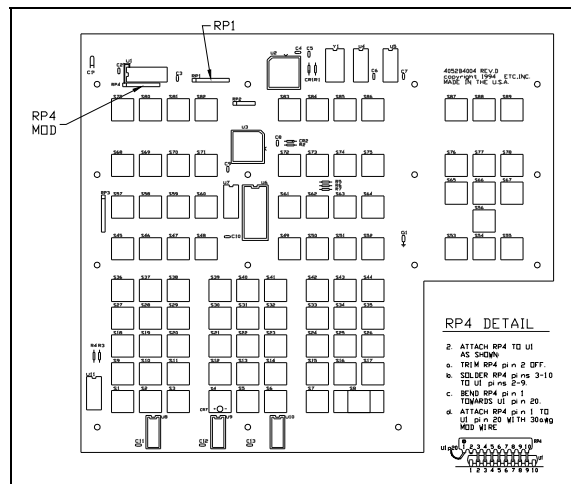


Figure 9

⁷ ECO 1942

⁸ ECO 1956

Submaster Pot. Board (4052B5005 and 4052B5027)

This modification grounds a floating bus buffer input. The face panel FIFO empty flag is read on this port along with the submaster bump buttons. The floating input injects enough noise into adjacent data lines to cause the flag and/or bump buttons to be misread. This procedure is performed on the boards without removing them from the console.

Note: Refer to Figure 10 during the following procedure when modifying 4052B5005 boards. These boards are identified by round bump buttons and one LED above each keycap. The board is shown inverted as it will appear when the console is opened for service.

1. Ensure power is OFF to the console.
2. Connect U4 pin 17 to U4 pin 10 with W106 wire on the solder side of the board⁹.
3. Perform the previous steps for the second submaster board if one is installed.
4. Enter today's date on one of the ECO labels (part I204) and affix it to the PC board.

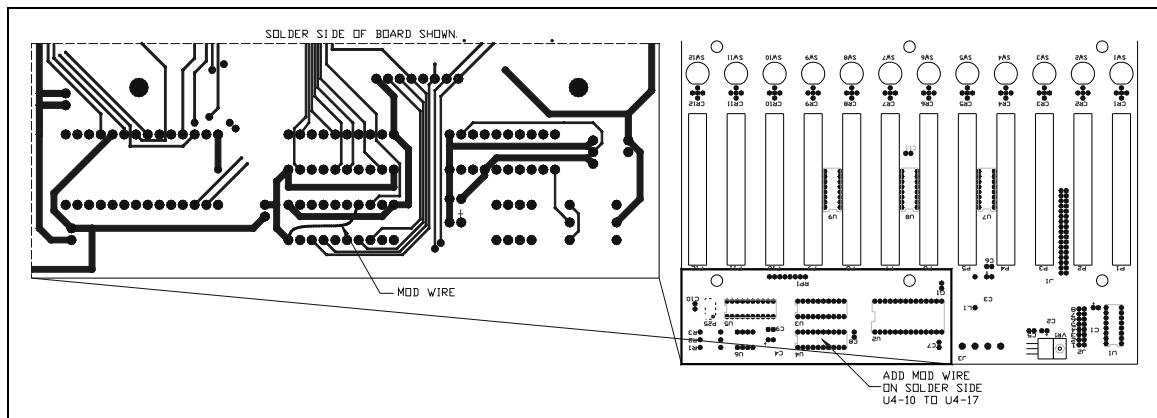


Figure 10

Note: Refer to Figure 11 during the following procedure when modifying 4052B5027 boards. These boards are identified by square bump buttons and two LEDs in the keycap. The board is shown inverted as it will appear when the console is opened for service.

1. Ensure power is OFF to the console.
2. Connect U2 pin 17 to U2 pin 10 with W106 wire on the solder side of the board¹⁰.
3. Perform the previous steps on the second submaster board if one is installed.
4. Enter today's date on one of the ECO labels (part I204) and affix it to the PC board.

⁹ ECO 1943

¹⁰ ECO 1943

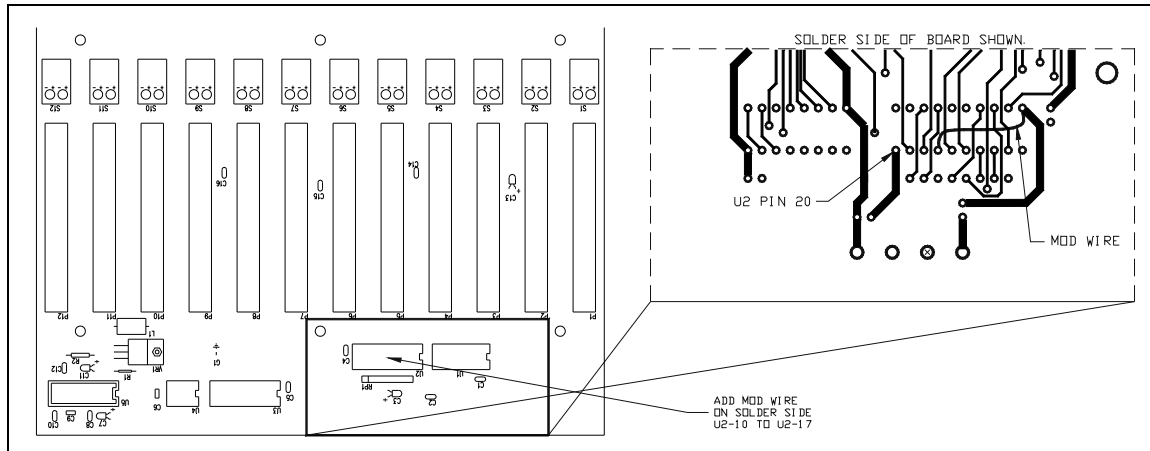


Figure 11

Switches (4052B7010 and 4052B7011)

This modification replaces the current GO, STOP/BACK, and BLACKOUT switches with a more reliable part. The previous switches had shown an unacceptable failure rate in test and in the field. This modification *must* be performed in conjunction with modifications to the face panel button board as described previously.

Note: Some older models of Obsession consoles mounted the GO and STOP/BACK switches directly in the console face panel ribs and not on a separate mounting plate. Ignore those instructions which refer to the mounting plate if they do not apply.

1. Ensure power is OFF to the console.
2. Unplug the GO and STOP/BACK switches from the face panel button board. Note the wire colors on each switch.
3. Remove the four screws holding the switch mounting plate to the face panel and remove the switch plate and switches from the console.
4. Remove the switches from the plate. Note the location of the switches.
5. Remove the switch nuts and button caps from the new switch assemblies.
6. Install switch spacers (part 4052A3104) on a new GO switch (part 4052B7010 with violet wires) and STOP/BACK switch (part 4052B7009 with gray wires)¹¹.
7. Install the new switches and spacers into the switch plate with the switch nuts.
8. Replace the button caps on the switches.
9. Connect the switches to the face panel button board.
10. Reinstall the switch plate into the console. Ensure the switch buttons are aligned in the openings before tightening the screws.
11. Unplug the BLACKOUT switch from the fader switch board.
12. Remove the switch from the fader switch board.
13. Remove the switch nut and button cap from the new switch assembly.
14. Install switch spacers (part 4052A3104) on new a BLACKOUT (part 4052B7009 with gray wires)¹².
15. Install the new switch and spacer into the fader switch board with the switch nut.
16. Replace the button caps on the switch.

¹¹ ECO 1956

¹² ECO 1956

17. Connect the switch to the fader switch board.

DC Power Supply wiring

1. Strip one end of the 18 AWG ground wire (part W329) and crimp on a #6 ring tongue terminal (part J427)¹³.
2. Remove one of the screws on the DC return terminals of the power distribution terminal strip. These should have only *brown* wires connected to the terminals.
3. Install the new ground wire and reconnect the screw removed in the previous step.
4. Route the new ground wire to the area close to the AC power entry module and locate the chassis ground stud. This should be the first connection to chassis from the power entry module.
5. Cut the new ground wire to length, strip it, and crimp on another #6 ring tongue terminal.
6. Remove the top nut from the chassis ground stud, install the new ground wire, and reinstall the nut.

Required Testing

1. Enable message and event logging with the maximum verbose level (3). Set the verbose as follows:
 - a. With scroll lock on, hold down the right Shift button and press Backspace twice. The message log will now say; 109 Verbose level = 1.
 - b. Continue pressing right Shift-Backspace until the message in the log says; 109 Verbose level = 3.
2. Verify that the face panel keys function correctly.
3. Bring up the diagnostic screen and verify that the bump buttons and submaster potentiometers function correctly.
4. Verify all remote console functions perform correctly as follows:
 - a. All Video outputs function.
 - b. RFU functions.
5. Perform ETCNet loop test from this console to all nodes in the system for a minimum of 100,000 passes. If this cannot be done, perform the loop test for as many times as practicable in the available time.
6. At the end of the ETCNet loop test, check the diagnostics and loop test screens for errors. The allowed errors are as follows:

ETCNet loop test:	1 reported error per node
Error 699: Keyboard sync problems	1 reported per console
7. Affix the ECO label (part I204) to the rear of the console close to the serial number label. It should be visible when viewing the serial and model numbers.
8. Complete and return the upgrade registration forms.

¹³ ECO 1956

Obsession RPU Upgrade Kit (4052S1015)

This modification kit will upgrade the Serf board and the DMX connector board in all production versions of Obsession RPUs.

Note: If the RPU is equipped with an 50 watt power supply, it will have to be replaced with kit 4052S1020. The 50 watt power supply can be identified by the cover over the power supply. Refer to kit 4052S1020 for the installation procedure. Refer to page 33 for the procedure.

The following are the parts required for this modification:

Part number	Quantity	Description	ECO reference
4052B7094	2	DIODE ASSEMBLY	2096
B154	1	FAN FINGER GUARD 92mm	2206
C105	1	CAP .01MF 100V .2" CERM	2096
C155	1	CAP 1000PF 50V 10% .2" DISC	1571
C168	1	CAP 10MF 20V 10% .1" TANT	2096
CR116	2	ZENER 500MW 5% 4.3V 1N5229b	2096
PAL1005B	1	SERF U36 7EE2 09/27/93 22V10	2096
PAL1015A	1	SERF U85 AC84 06/18/96 22V10	1998
PAL1052	1	SERF U27 7F62 10/14/93 22V10	2096
PAL1056A	1	SERF U40 8BEB 06/18/96 22V10	1998
R316	1	RES/SIP 4.7K 10P 9R	1942
W106	6"	WIRE 30GA GREEN 125C KYNAR	2096
Z181	1	IC 74HC14 INVERTER 14P	1944
Z190	1	IC 74HC259 8 ADRSBLE	1945
I204	4	LABEL .8"X.25" PAL	2205

The following are the installation instructions for this modification:

Obsession Serf Board (4052B5011)

This modification performs the following modifications to the Serf board:

- Add a 0.01 μ F capacitor to the /RESET line to filter noise spikes that cause memory corruption and random errors.
- Add the low-true reset signal from the I960 reset generator to the base of the show memory power fail sense transistor through a diode. This prevents the memory enable until after the I960 reset has timed out. The memory cannot be accessed during this time.
- Add the ISA bus reset signal, after buffering, to the base of the show memory power fail sense transistor through a diode. This prevents the memory enable until the ISA bus reset has timed out. The memory cannot be accessed during this time.
- Change the zener diodes in both battery backup switches to disable the memories until the +5 volt supply has risen to a high enough level to allow the reset signals to stabilize.
- Change the I960 reset time capacitor to shorten the over-long reset time.
- Remove capacitors from the thin-net shield to digital ground. This reduces the noise injected into digital ground.
- Change the Ethernet chip interface PAL to correct timing which caused intermittent failures.
- Add a resistor pull-up package to the BD data lines. This puts floating data lines to a known state during single bit reads to reduce noise.
- Change a 74LS259 latch to 74HC259 to prevent noise on the output line from changing the state of the DMX switcher selection.
- Add a 1000 pF capacitor to the DMX control line to help prevent noise on the output line from changing the state of the output on revision C and D boards only.

Note: Different changes are required according to the revision level of the board. The following sections detail the changes for each case.

Serf board revision D & E

Note: Refer to Figure 13 and Figure 14 during modifications to the revision D and later Serf boards.

1. Turn power OFF to the RPU and wait until it has cycled down.
2. Unplug the power cord from the power entry module.
3. Remove the RPU from the rack.
4. Remove the top cover.
5. Remove the attaching hardware from the rear panel connectors of the Serf and Optional I/O boards. Retain the hardware for later reinstallation.
6. Unplug the power harness and any other cables connected to the Serf board.
7. If the Optional I/O board is installed, perform the following steps:
 - a. Disconnect the ribbon cable at the Serf board connector.
 - b. Remove the four mounting screws and remove the Optional I/O board.
 - c. Remove the mounting screws for the Optional I/O mounting bracket and remove the bracket.
8. Remove the mounting screws and standoffs for the Serf board and remove the board from the chassis.
9. Modify the board as follows:
 - a. If U27 1052A is present, remove it and install U27 1052¹.
 - b. Remove U40 1056 and install U40 1056A².
 - c. If there is a 30 AWG mod wire running from U27 pin 3 to either J8 pin A2 or U3 pin 12 on the solder side of the board, remove it.
 - d. If a mod wire was removed in the previous step, reconnect U27 pin 3 to the feed-through it was originally connected to. Use 30 AWG mod wire (part W106) for this purpose.
 - e. Install a 0.01 μ F capacitor (part C105) on the solder side of the board between J8 pins A2 and B1. Use a drop of wire adhesive to secure the body of the capacitor to the board³.
 - f. Solder the anode lead of one of the diode assemblies (part 4052B7094) to the center base lead of Q2.
 - g. Solder the flying lead to U3 pin 11. Use wire adhesive to secure the wire and diode body to the board.
 - h. Solder the anode lead of one of the diode assemblies (part 4052B7094) to the center base lead of Q8.
 - i. Solder the flying lead to U41 pin 5. Use wire adhesive to secure the wire and diode body to the board.
 - j. Remove CR19 and CR22 and replace them with 1N5229B zener diodes (part CR116).
 - k. Remove C134 and replace it with a 10 μ F/20 volt tantalum capacitor (part C168).
 - l. Remove U44 and install a 74HC259 (part Z190)⁴.
 - m. Locate C30 and C31 close to the thin-net BNC and remove them from the board⁵. Refer to Figure 12 while installing the resistor pack to U55.
 - n. Cut pin 2 off of the resistor pack (part R316)⁶.

¹ ECO 2096

² ECO 1998

³ ECO 2096

⁴ ECO 1945

⁵ ECO 1948

⁶ ECO 2302

- o. Stand the resistor pack beside U55 on the pin 11 to 20 side of the IC. Orient the resistor pack with pin 1 of the resistor pack at U55 pin 20.
 - p. Solder the resistor pack to the pins of the IC.
The following two steps apply to revision D Serf boards ONLY⁷.
 - q. Bend the pins of the 1000 pF disc capacitor (part C155) to fit between pins 12 and 8 of U44 with the capacitor body lying flat on top of the IC.
 - r. Solder the capacitor leads to U44 at pins 12 and 8.
 - s. Enter today's date on one of the ECO labels (part I204) and affix it to the PC board.
10. Remove the paint from the inside of the console around the shielded D-subminiature connectors to the size of the connectors. Use a sharp screwdriver, sandpaper, or other instrument as desired⁸.
 11. Thoroughly clean the inside of the chassis in the area of the Serf board to remove all metal filings and debris.
 12. Replace the Serf board into the chassis and reinstall the mounting screws and standoffs to hold it in place.
 13. Replace the external mounting hardware for the Serf board connectors.
 14. Reinstall the Optional I/O mounting bracket and board.
 15. Replace the external mounting hardware for the Optional I/O board.
 16. Reconnect all cables and harnesses which were previously removed.

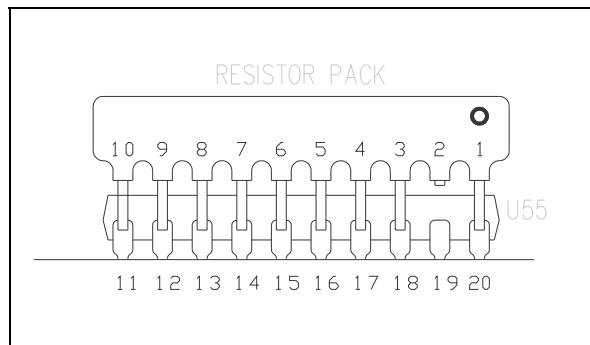


Figure 12

⁷ ECO 1571

⁸ ECO 1957

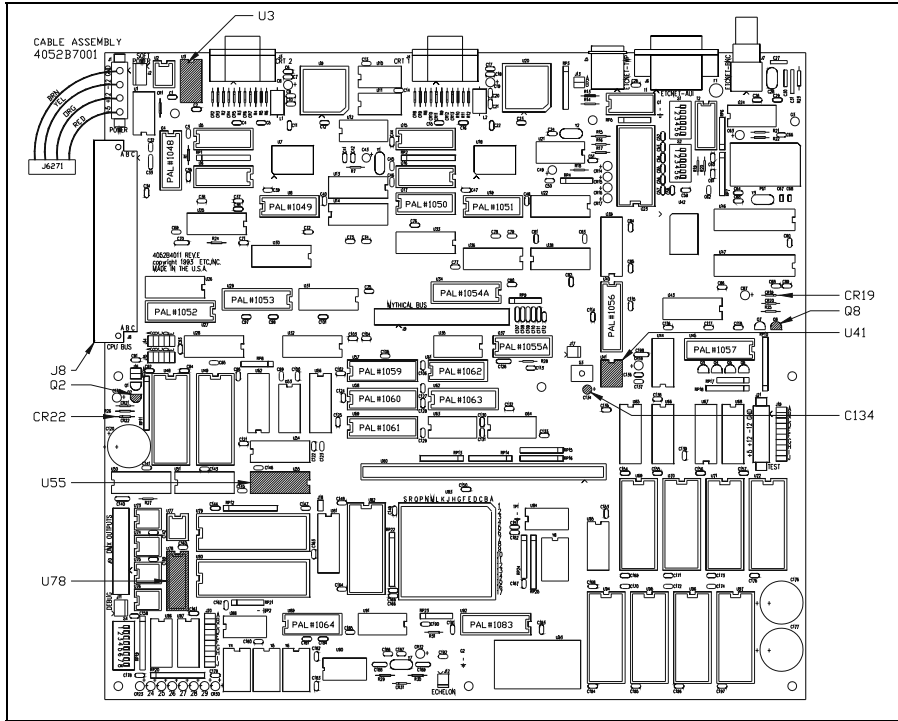


Figure 13

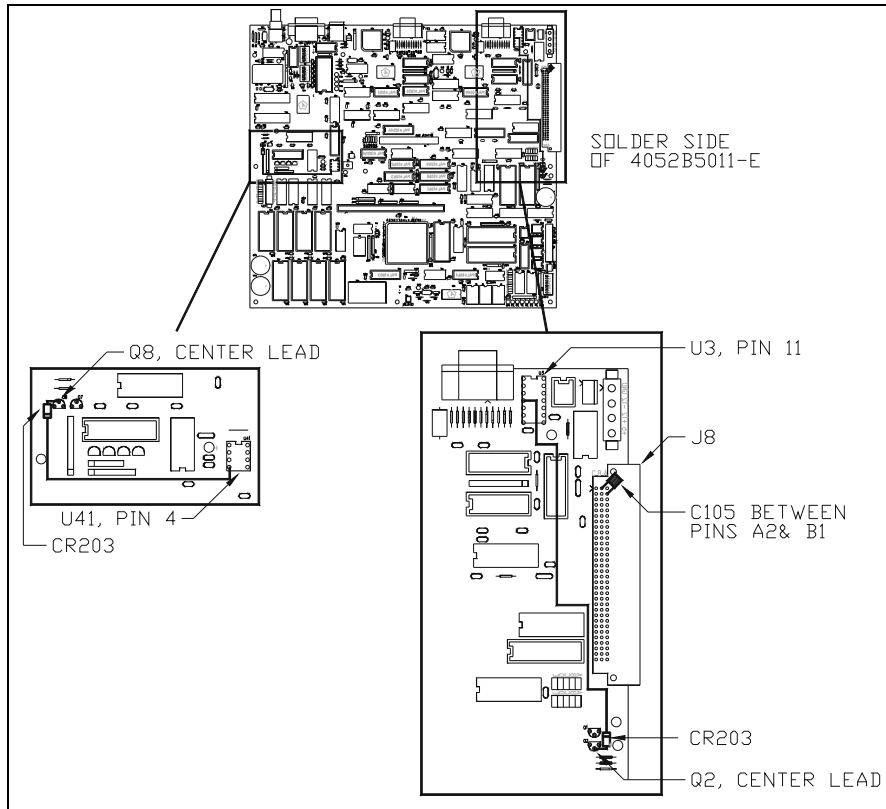


Figure 14

Serf board revision C

1. Turn power OFF to the RPU and wait until it has cycled down.
2. Unplug the power cord from the power entry module.
3. Remove the RPU from the rack.
4. Remove the top cover.
5. Remove the attaching hardware from the rear panel connectors of the Serf and Optional I/O boards. Retain the hardware for later reinstallation.
6. Unplug the power harness and any other cables connected to the Serf board.
7. If the Optional I/O board is installed, perform the following steps:
 - a. Disconnect the ribbon cable at the Serf board connector.
 - b. Remove the four mounting screws and remove the Optional I/O board.
 - c. Remove the mounting screws for the Optional I/O mounting bracket and remove the bracket.
8. Remove the mounting screws and standoffs for the Serf board and remove the board from the chassis.
9. Modify the board as follows:
 - a. If U36 1005C is present, remove it and install U36 1005B⁹.
 - b. Remove U85 1015 and install U85 1015A¹⁰.
 - c. If there is a 30 AWG mod wire running from U36 pin 3 to either J8 pin A2 or U3 pin 12 on the solder side of the board, remove it.
 - d. If a mod wire was removed in the previous step, reconnect U36 pin 3 to the feed-through it was originally connected to. Use 30 AWG mod wire (part W106) for this purpose.
 - e. Install a 0.01 μ F capacitor (part C105) on the solder side of the board between J2 pins A2 and B1. Use a drop of wire adhesive to secure the body of the capacitor to the board¹¹.
 - f. Solder the anode lead of one of the diode assemblies (part 4052B7094) to the center base lead of Q2.
 - g. Solder the flying lead to U3 pin 11. Use wire adhesive to secure the wire and diode body to the board.
 - h. Solder the anode lead of one of the diode assemblies (part 4052B7094) to the center base lead of Q4.
 - i. Solder the flying lead to U41 pin 5. Use wire adhesive to secure the wire and diode body to the board.
 - j. Remove CR19 and CR31 and replace them with 1N5229B zener diodes (part CR116).
 - k. Remove C170 and replace it with a 10 μ F/20 volt tantalum capacitor (part C168).
 - l. Remove U78 and install a 74HC259 (part Z190)¹².
 - m. Locate C76 and C77 close to the thin-net BNC and remove them from the board¹³. Refer to Figure 12 while installing the resistor pack to U55¹⁴.
 - n. Cut pin 2 off of the resistor pack (part R316).
 - o. Stand the resistor pack beside U55 on the pin 11 to 20 side of the IC. Orient the resistor pack with pin 1 of the resistor pack at U55 pin 20.

⁹ ECO 2096

¹⁰ ECO 1998

¹¹ ECO 2096

¹² ECO 1945

¹³ ECO 1948

¹⁴ ECO 2302

- p. Solder the resistor pack to the pins of the IC.
 - q. Bend the pins of the 1000 pF disc capacitor (part C155) to fit between pins 12 and 8 of U78 with the capacitor body lying flat on top of the IC¹⁵.
 - r. Solder the capacitor leads to U78 pins 12 and 8.
 - s. Enter today's date on one of the ECO labels (part I204) and affix it to the PC board.
10. Remove the paint from the inside of the chassis around the shielded D-subminiature connectors to the size of the connectors. Use a sharp screwdriver, sandpaper, or other instrument as desired¹⁶.
 11. Thoroughly clean the inside of the chassis in the area of the Serf board to remove all metal filings and debris.
 12. Remove the fan mounting hardware and remove the fan filter.
 13. Reinstall the fan with a fan finger guard (part B154) on the outside of the chassis¹⁷.
 14. Replace the Serf board into the chassis and reinstall the mounting screws and standoffs to hold it in place.
 15. Replace the external mounting hardware for the Serf board connectors.
 16. Reinstall the Optional I/O mounting bracket and board.
 17. Replace the external mounting hardware for the Optional I/O board.
 18. Reconnect all cables and harnesses which were previously removed.

Note: The following two procedures are intended only for the later model RPUs. These are identified by the clear aluminum chassis and a green LED power indicator on the front panel. No modification is required for the earlier production model RPUs which are identified by the black painted chassis and no power indicator LED on the front panel.

DMX Connector Board (4052B4029)

1. Ensure power is OFF to the RPU.
2. Disconnect the ribbon cable from the DMX connector board.
3. Cut the connection to pin 1 at all three connectors¹⁸.
4. Connect pin 1 to the chassis ground lug at each connector.
5. Enter today's date on one of the ECO labels (part I204) and affix it to the PC board.

Power Distribution Board (4052B5028)

Refer to Figure 15 during the following procedure.

1. Ensure power is OFF to the RPU.
2. Disconnect all cables and harnesses from the power distribution board.
3. Remove the mounting screws and remove the power distribution board.
4. Remove the 74LS259 at U1 and install the 74HC259 (part Z181)¹⁹.
5. Reinstall the power distribution board into the chassis.
6. Reconnect all cables and harnesses previously removed.
7. Enter today's date on one of the ECO labels (part I204) and affix it to the PC board.

¹⁵ ECO 1571

¹⁶ ECO 1957

¹⁷ ECO 2294

¹⁸ ECO 2042

¹⁹ ECO 1944

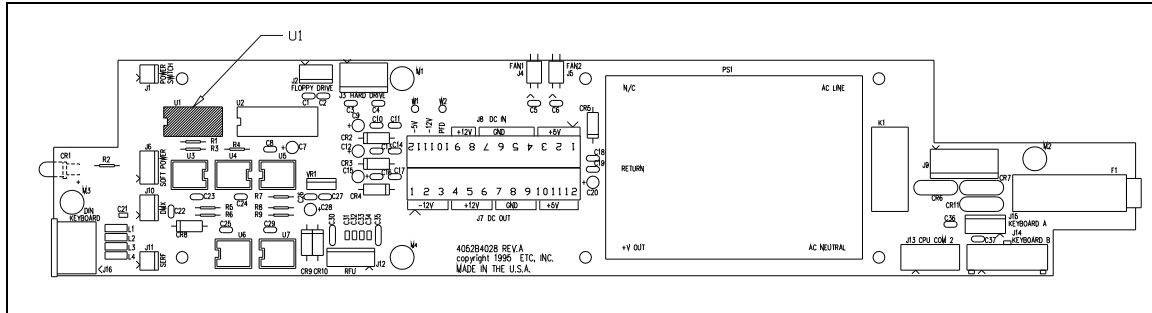


Figure 15

Required Testing

1. Enable message and event logging with the maximum verbose level.
2. Verify all console functions perform correctly as follows:
 - a. All DMX ports function.
 - b. All Video outputs function.
 - c. ETCLink functions.
 - d. MIDI/SMPTE function.
 - e. RFU functions.
3. Perform ETCNet loop test from this console to all nodes in the system for a minimum of 100,000 passes. If this cannot be done, perform the loop test for as many times as practicable in the available time.
4. At the end of the ETCNet loop test, check the diagnostics and loop test screens for errors. The allowed errors are as follows:

ETCNet loop test:	1 reported error per node
-------------------	---------------------------
5. Affix the ECO label (part I204) to the rear of the RPU close to the serial number label. It should be visible when viewing the serial and model numbers.
6. Complete and return the upgrade registration forms.

Obsession Remote Interface Upgrade Kit (4052S1016)

This modification kit will upgrade the Node board in all production versions of the Obsession Remote Interface assemblies. The following are the parts required for this modification:

Part number	Quantity	Description	ECO reference
I204	2	LABEL .8"X.25" PAL	2205
J427	2	TERM RING #6 22-18AWG RED	1950
PAL1024	1	NODE U68 D114 06/21*93 22V10	2096
PAL1025B	1	NODE U75 4D2B 06/18/96 22V10	1998
R316	1	RES/SIP 4.7K 10P 9R	2370
W329	36"	WIRE 18GA 300V 105C GRN/YEL	1950
Z537	1	IC 29F010-120 FLASH DIP32	2371

The following are the installation instructions for this modification:

Node Board (4052B5014)

Note: This modification changes PALs on the Node board and makes other changes which increase the reliability of the board. Refer to Figure 17 during the following procedure.

1. Turn power OFF to the remote interface.
2. Unplug the power cord from the power entry module.
3. Remove the top cover.
4. Remove the attaching hardware from the rear panel connectors of the Node board. Retain the hardware for later reinstallation.
5. Unplug the power harness and any other cables connected to the Node board.
6. Remove the mounting screws and standoffs for the Node board and remove the board from the chassis.
7. Remove the paint from the inside of the console around the shielded D-subminiature connectors to the size of the connectors. Use a sharp screwdriver, sandpaper, or other instrument as desired¹.
8. Thoroughly clean the inside of the chassis in the area of the Node board to remove all metal filings and debris.
9. Remove U75 1025A and install U75 1025B².
10. Locate C78 and C79 close to the thin-net BNC and remove them from the board³.
11. Locate U68 and lift the label to identify the manufacturer of the part⁴.
 - a. If U68 is not a TI part, replace it with U68 (part PAL1024) from the parts kit.
 - b. Discard the old GAL.
12. Remove the EPROM from U34 (part Z254) and replace it with the Flash EEPROM (part Z537)⁵.
13. Install a resistor pull-up pack to U58 as follows⁶:

Refer to Figure 16 during the following procedure.

 - a. Cut pin 2 off of the 4.7K resistor pack (part R316).

¹ ECO 1957

² ECO 1998

³ ECO 19498

⁴ ECO 2106

⁵ ECO 2371

⁶ ECO 2370

- b. Stand the resistor pack beside U58 with pin 1 of the resistor pack at pin 20 of U58.
 - c. Solder the pins of the resistor pack to the legs of U58 at pins 11 through 18 and pin 20.
14. Replace the Node board into the chassis and reinstall the mounting screws and standoffs to hold it in place.
 15. Replace the external mounting hardware for the Node board connectors.
 16. Reconnect all cables and harnesses which were previously removed.
 17. Enter today's date on one of the ECO labels (part I204) and affix it to the PC board.

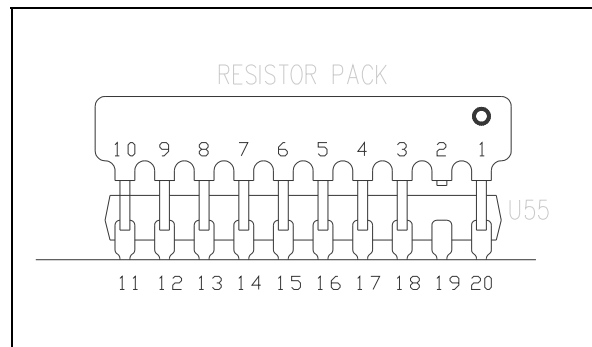


Figure 16

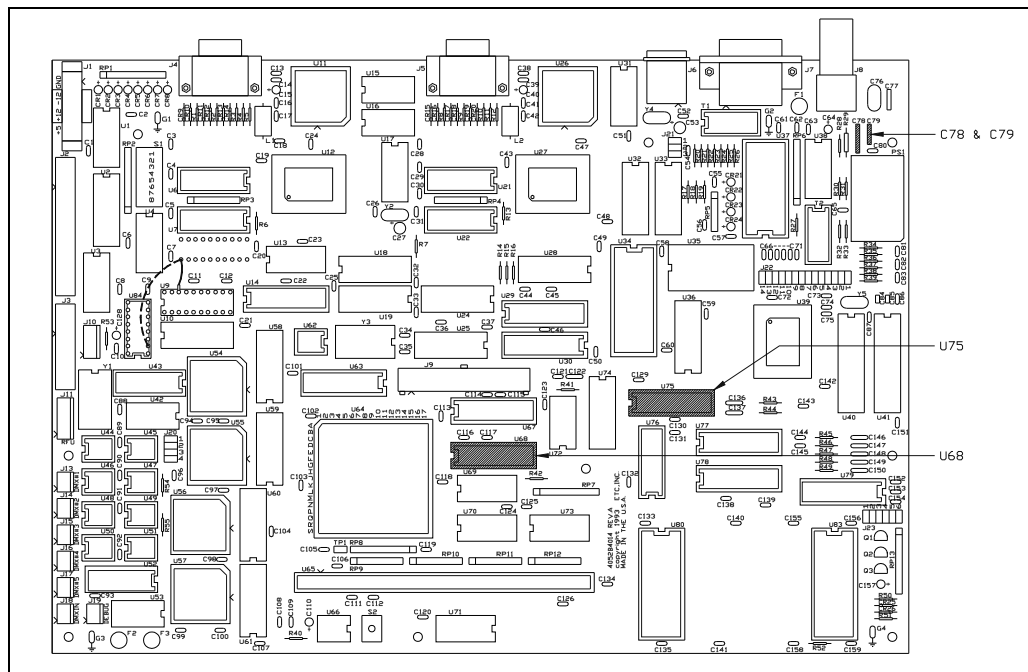


Figure 17

DC Power Supply wiring

1. Strip one end of the 18 AWG ground wire (part W329) and crimp on a #6 ring tongue terminal (part J427)⁷.

⁷ ECO 1950

2. Remove one of the screws on the DC return terminals of the power distribution terminal strip. These should have only *brown* wires connected to the terminals.
3. Install the new ground wire and reconnect the screw removed in the previous step.
4. Route the new ground wire to the area close to the AC power entry module and locate the chassis ground stud. This should be the first connection to chassis from the power entry module.
5. Cut the new ground wire to length, strip it, and crimp on another #6 ring tongue terminal.
6. Remove the top nut from the chassis ground stud, install the new ground wire, and reinstall the nut.

Required Testing

1. Enable message and event logging with the maximum verbose level.
2. Bring up the diagnostic screen.
3. Verify all remote interface functions perform correctly as follows:
 - a. All DMX ports function.
 - b. All Video outputs function.
 - c. RFU functions.
4. Perform ETCNet loop test from the console or keyboard to all nodes in the system for a minimum of 100,000 passes. If this cannot be done, perform the loop test for as many times as practicable in the available time.
5. At the end of the ETCNet loop test, check the diagnostics screen for errors. The allowed errors are as follows:

ETCNet loop test:	1 reported error per node
-------------------	---------------------------
6. Affix the ECO label (part I204) to the rear of the chassis close to the serial number label. It should be visible when viewing the serial and model numbers.
7. Complete and return the upgrade registration forms.

Obsession Remote Video Interface Upgrade Kit (4052S1017)

This modification kit will upgrade the Remote Video Interface CPU board in all production versions of Obsession RVIs. The following are the parts required for this modification:

Part number	Quantity	Description	ECO reference
J427	1	TERM RING #6 22-18AWG RED	1950
J430	1	TERM DISC M .250 16-14 FI BLUE	1950
PAL1091A	1	RVIP U16 B42A 06/18/96 22V10	1998
W329	36"	WIRE 18GA 300V 105C GRN/YEL	1950
I204	2	LABEL .8"X.25" PAL	2205
Z537	1	IC 20F010-120 FLASH DIP32	2371

The following are the installation instructions for this modification:

RVI CPU Board (4053B5001)

This modification changes a PAL on the RVI CPU board and makes other changes which increase the reliability of the board.

Note: Refer to Figure 18 during modifications to the RVI CPU board.

1. Turn power OFF to the RVI.
2. Unplug the power cord from the power entry module.
3. Remove the top cover from the chassis.
4. Remove the attaching hardware from the rear panel connectors of the CPU and video boards. Retain the hardware for later reinstallation.
5. Unplug the power harness and any other cables connected to the CPU board.
6. Remove the two screws which hold the front panel to the chassis bottom and remove the front panel.
7. Remove the two screws which hold the rear of the video board and lift it up enough to unplug it from the CPU board.
8. Remove the video board from the chassis.
9. Remove the paint from the inside of the chassis around the shielded D-subminiature connectors to the size of the connectors. Use a sharp screwdriver, sandpaper, or other instrument as desired¹.
10. Thoroughly clean the inside of the chassis to remove all metal filings and debris.
11. Replace the CPU board into the chassis and reinstall the screws and standoffs to hold it in place.
12. Remove U16 1091 and install U16 1091A².
13. Locate C28 and C29 close to the thin-net BNC and remove them from the board³.
14. Remove the EPROM from U33 (part Z254) and replace it with the Flash EEPROM (part Z537)⁴.
15. Replace the video board above the CPU.
16. Align the connector and plug the rear of the video board into the CPU.
17. Replace the front panel.

¹ ECO 1957

² ECO 1998

³ ECO 2102

⁴ ECO 2371

18. Reconnect all cables and harnesses which were previously removed.
19. Enter today's date on one of the ECO labels (part I204) and affix it to the PC board.

DC Power Supply wiring

1. Disconnect the brown wire connected to the RFU connector at the quick-connect.
2. Cut off the quick-connect on the wire going to the power supply and strip back the wire insulation⁵.
3. Strip one end of the 18 AWG ground wire (part W329).
4. Push the new ground wire and the brown wire into the new quick-connect (part J430) and crimp them.
5. Reconnect the quick-connect to the brown wire from the RFU connector.
6. Route the new ground wire to the area close to the AC power entry module and locate the chassis ground stud. This should be the first connection to chassis from the power entry module.
7. Cut the ground wire to length.
8. Strip the end of the ground wire and crimp on a ring tongue terminal (part J427).
9. Remove the top nut from the chassis ground stud, install the new ground wire, and reinstall the nut.
10. Reinstall the connector mounting hardware which was previously removed.
11. Reinstall the top cover.

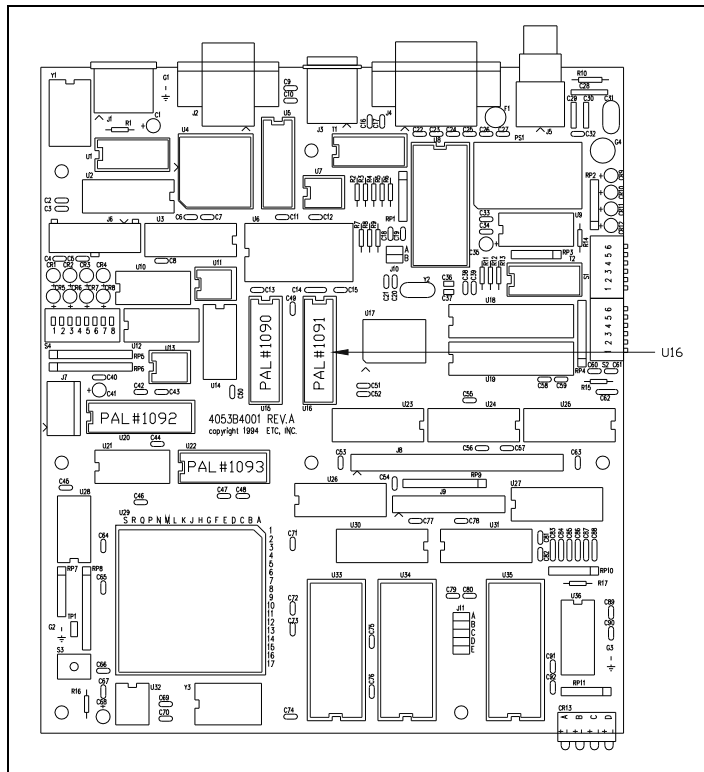


Figure 18

⁵ ECO 1950

Required Testing

1. Enable message and event logging with the maximum verbose level.
2. Bring up the diagnostic screen.
3. Verify all remote video interface functions perform correctly as follows:
 - a. All Video outputs function.
 - b. RFU functions.
4. Perform ETCNet loop test from the console or keyboard to all nodes in the system for a minimum of 100,000 passes. If this cannot be done, perform the loop test for as many times as practicable in the available time.
5. At the end of the ETCNet loop test, check the diagnostics screen for errors. The allowed errors are as follows:

ETCNet loop test:	1 reported error per node
-------------------	---------------------------
5. Affix the ECO label (part I204) to the rear of the chassis close to the serial number label. It should be visible when viewing the serial and model numbers.
6. Complete and return the upgrade registration forms.

Obsession RPU Power Supply Upgrade Kit (4052S1020)

This modification will upgrade the DC power supply and harness for early production Obsession RPU assemblies. The following are the parts required for this modification:

Part number	Quantity	Description	ECO reference
4052A3105	1	OBSN RPU PS UPGRADE MTG PLATE	2206
4052B7095	1	POWER SUPPLY WIRING HARNESS	2206
HW2141	2	NUT 6-32 KEPS 5/16 9/64 SS E	2206
HW5210	5	STUD COVER .187X.5 BLACK	2206
HW701	8	CABLE TIE; 4", #PLT1M	2206
HW741	3	CABLE TIE MOUNT ADHESIVE BACK	2206
J4118	1	TERM DISC M 22-18GA 250 FI RED	2206
J3267	2	TERM STRIP JUMPER J630	2206
J427	5	TERM RING #6 22-18AWG RED	2206
PS132	1	PWR SUP 5V/+12V 80W	2206

Note: This procedure is performed in addition to the Obsession RPU upgrade (4052S1015) on older production RPU assemblies. These RPUs are identified by the black painted exterior of the chassis versus the clear chromate aluminum of the later production model plus a green power indicator LED on the front panel which was not on the earlier model.

The following are the installation instructions for this modification¹:

1. Turn power OFF to the RPU and wait until it has cycled down.
2. Unplug the power cord from the power entry module.
3. Turn the RPU over so the bottom is UP and remove the bottom cover.
4. Remove the power supply cover and retain the four Nylock nuts. The old cover may be scrapped.
5. Unplug the existing power supply harness from the power supply.
6. If possible, remove the power supply harness from the power distribution terminal strip. It may be left in place if it is too difficult to remove.
7. Remove the screws on the power distribution terminal strip terminals which have jumper wires connected to them.
8. Remove the jumper wires and install the two terminal strip jumpers (part J3267) in their places. The jumpers should be installed between the terminals if there are two terminals under the screw. Otherwise it should be on the bottom.
9. Reinstall the power distribution terminal strip screws on the jumped terminals.
10. Locate the power entry module on the rear panel and follow the chassis ground wire to the first ground stud.

If the first chassis ground connection from the power entry module is not the stud adjacent to the power entry module on the rear panel and just below the fuse holder, the chassis ground wiring must be modified as follows:

- a. Remove the first chassis ground connection from its current location and move it close to the chassis ground stud identified above.
- b. Place the chassis ground wire terminal on the stud and secure it with a #6 KEPS nut (part HW2141).
- c. Strip one end of the 18 AWG ground wire (part W329) and crimp on a #6 ring tongue terminal (part J427).
- d. Install this terminal on chassis ground stud on top of the KEPS nut.
- e. Route the wire to the chassis ground terminal of the DC power supply. This is the corner mounting screw closest to the AC power connector.

¹ ECO 2206

- f. Cut the new chassis ground wire to length.
- g. Strip the end of the wire and crimp on a #6 ring tongue terminal (part J427).
11. Strip one end of the 18 AWG ground wire (part W329) and crimp on a #6 ring tongue terminal (part J427).
12. Install this terminal on the chassis ground stud on top of the previous terminal. Secure both terminals with a second KEPS nut (part HW2141).
13. Route the wire to the DC return terminals of the power distribution terminal strip. These should have only *brown* wires connected to the terminals.
14. Remove one of the screws on the DC return terminals of the power distribution terminal strip.
15. Strip the end of the wire and crimp on a #6 ring tongue terminal (part J427).
16. Install the new chassis ground wire and reconnect the screw removed in the previous step.
17. Remove the screws which hold the power supply to the chassis standoffs and remove the power supply board from the chassis. Retain four of the screws.
18. Install the new power supply mounting plate (part 4052A3105) on the studs which previously held the power supply cover. Use the four Nylock nuts to secure the new mounting plate.
19. Install the five black stud covers (part HW5210) over the five chassis standoffs.
20. Mount the new power supply (part PS132) to the four mounting standoffs of the new mounting plate. Use the four mounting screws to secure the power supply.
21. Connect the chassis ground lead under the mounting screw close to the AC power connector.
22. Plug the new power supply harness onto the new power supply. Route the ring terminal ends of the wires to the power distribution strip.
23. Follow the orange +12 volt wire from the power connector of the RFU link board to the distribution terminal strip.
24. Cut the wire at the terminal, strip the insulation, and crimp on a male quick-connect terminal (part J4118).
25. Plug this wire onto the female quick-connect which is on the gray wire flying lead of the new power supply harness.
26. Connect the ring terminal ends of the new power supply harness to the power terminal strip.
27. Plug the AC connector onto the AC power pins of the power supply with the black wire connected to the L terminal and the white wire connected to the N terminal.
28. Replace any cable ties (part HW701) which were cut off or adhesive backed cable tie mounts (part HW741) which were removed during the previous steps.
29. Tighten all of the screws on the power distribution terminal strip.
30. Inspect the installation for loose hardware, crossed wires, or any other problems.

Required Testing

1. Turn the power to the system ON.
2. Connect the DVM to DC return and +5 volts test points on the Serf board. These test points are as follows:

+5 volts	TP1 (next to the I960)
DC return	Rev C board use G1 located above U78
	Rev D board use G2 located below U92
3. Adjust Vo1 on the power supply for a measured +5.00 ±0.05 volts.
4. Connect the DVM to the DC return (brown wire) and the second +12 volts (gray wire from the power supply harness) at the RFU link board.
5. Adjust Vo2 on the power supply for +12.00 ±0.10 volts.

6. Measure the rest of the power supply output voltages at the power distribution terminal strip and verify they are within the specified range as follows:
 - a. +12 volts (orange wires) $+12.00 \pm 0.60$ volts.
 - b. -12 volts (yellow wires) -12.00 ± 0.60 volts.
7. Affix the ECO label (part I204) to the rear of the RPU close to the serial number label.
8. Complete and return the upgrade registration forms.

Upgrade Registration

Company Name _____ (Company Name)
 Facility Name _____ (Studio or Hall Name)
 Address _____ (Shipping Address)
 City _____, State ____ ZIP _____
 Contact _____ (Contact Name)
 Job Number _____ (ETC Job Number)

Phone 1 _____
 Phone 2 _____
 FAX _____

Installed By _____ (Technician Name)
 Install Date _____
 Serial Number _____ (Full SN#...11/2/92 OBSN-0002)
 Model # _____ (Full Model Number)
 SW Version _____
 Memory Upgrade YES NO 4SRAM=YES 8SRAM=NO

Network Type Thinnet Twisted Pair Thicknet (Check one)
 I/O Installed YES NO (Check one)
 Options Used MIDI SMPTE ETCLink (Check all that apply)

Serf PCB SN# _____ (Serf SN# and revision letter)
 Opt I/O PCB SN# _____ (I/O SN# and revision letter)
 Facepanel PCB SN# _____ (FP SN# and revision letter)
 Sub#1 PCB SN# _____ (Sub#1 SN# and revision letter)
 Sub#2 PCB SN# _____ (FP SN# and revision letter)
 Power Dist PCB SN# _____ (Power Dist SN# and revision letter)
 Node PCB SN# _____ (Node SN# and revision letter)
 RVI CPU PCB SN# _____ (RVI CPU SN# and revision letter)
 RVI Video PCB SN# _____ (RVI Video SN# and revision letter)
 486 PCB SN# _____ (SN#) TEKNOR SIGMA

ECOs Performed
 ECO 1942 ECO 1943 ECO 1944 ECO 1945 ECO 1948 ECO 1949
 ECO 1950 ECO 1956 ECO 1957 ECO 1998 ECO 2042
 ECO 2096 ECO 2102 ECO 2106 ECO 2206 ECO 2294
 ECO 2302 ECO 2370 ECO 2371

ETC Service # _____ (Call ETC Tech Services)
 Hours on Site _____
 Notes _____

Please return completed form with your invoice

ETC Technical Services
 ATTN: Obsession Upgrade Forms
 3030 Laura Lane
 Middleton, WI 53562
 800-775-4382 phone
 608-836-1736 fax

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