Installation, Operation, and Maintenance Manual for 4.5-INCH ENVIRONMENTAL HOUSING

Technical Manual 6X-944(A)

April 8, 1994
Revision 1 Nov. 20, 1996

COHU, INC., ELECTRONICS DIVISION
Note that our address and area code have changed.

Correspondence	Delivery
PO Box 85623	3912 Calle Fortunada
San Diego CA 92186	San Diego CA 92123

T: 858/277-6700 F: 858/277-0221 E: info@cohu.com

TABLE OF CONTENTS

Section		Page
SECTION I	**GENERAL DESCRIPTION**	
1.1	Introduction	1-1
1.2	Electrical Characteristics	1-2
1.3	Mechanical Characteristics	1-2
1.4	Equipment Supplied	1-4
1.5	Equipment Required But Not Supplied	1-4
SECTION II	**INSTALLATION**	
2.1	Introduction	2-1
2.2	Unpacking and Receiving Inspection	2-1
2.3	Installation Procedure	2-1
2.4	Preparation For Shipment and Storage	2-1
SECTION III	**OPERATION**	
3.1	Operating Procedures	3-1
SECTION IV	**CIRCUIT DESCRIPTIONS**	
4.1	Introduction	4-1
SECTION V	**MAINTENANCE**	
5.1	Introduction	5-1
5.2	Static Discharge Protection	5-1
5.3	Test Equipment Required	5-2
5.4	Cleaning and Lubrication	5-2
5.5	Desiccant Pack Drying	5-2
5.6	Relative Humidity Indicator	5-2
5.7	Performance Tests	5-3
5.8	Camera Removal and Replacement	5-3
SECTION VI	**PARTS LISTS**	
6.1	Parts List Use	6-1

LIST OF ILLUSTRATIONS

Figure		Page
1-1	Dimensions, Housing	1-1
1-2	Dimensions, Mounting Base	1-3
1-3	Window Assembly	1-4
1-4	Rear Plate	1-4
1-5	Location of Components, Rear Plate	1-5

LIST OF TABLES

Table		Page
1-1	Specifications	1-2
6-1	Parts List, Type 8418001-003 Housing Kit Installation	6-2
6-2	Parts List, Type 8418305-001 and -003 Rear Plate Kit (8240 Series)	6-3
6-3	Parts List, Type 8344205-001 through -008 Rear Plate Kit (4940 Series)	6-4
6-4	Parts List, Type 8344605-001 Variable Phase Switch and Cable Assembly (4940 Series)	6-5
6-5	Parts List, Type 8418901-001 115 Vac Heater Kit Installation	6-5
6-6	Parts List, Type 8418601-001 6:1 Zoom Lens Kit Installation	6-6
6-7	Parts List, Type 8418701-001 10:1 Zoom Lens Kit Installation	6-6

SECTION I
GENERAL DESCRIPTION

1.1 INTRODUCTION

The 4.5-inch Housing (fig. 1-1) encloses a camera in a sealed, pressurized barrel to protect the camera against harsh environmental conditions. The following optional equipment and related manuals are also available:

- ID Generator (6X-928(B))
- Zoom Lens Driver (6X-943)
- Fiber Optic Video Output
- Auxiliary 12 V Power Supply (required for the above options) (6X-941)
- Heaters (115 V ac only)

See the appropriate manual (shown in parentheses) for information on the ID Generator, the Zoom Lens Driver, and the Auxiliary 12 V Power Supply.

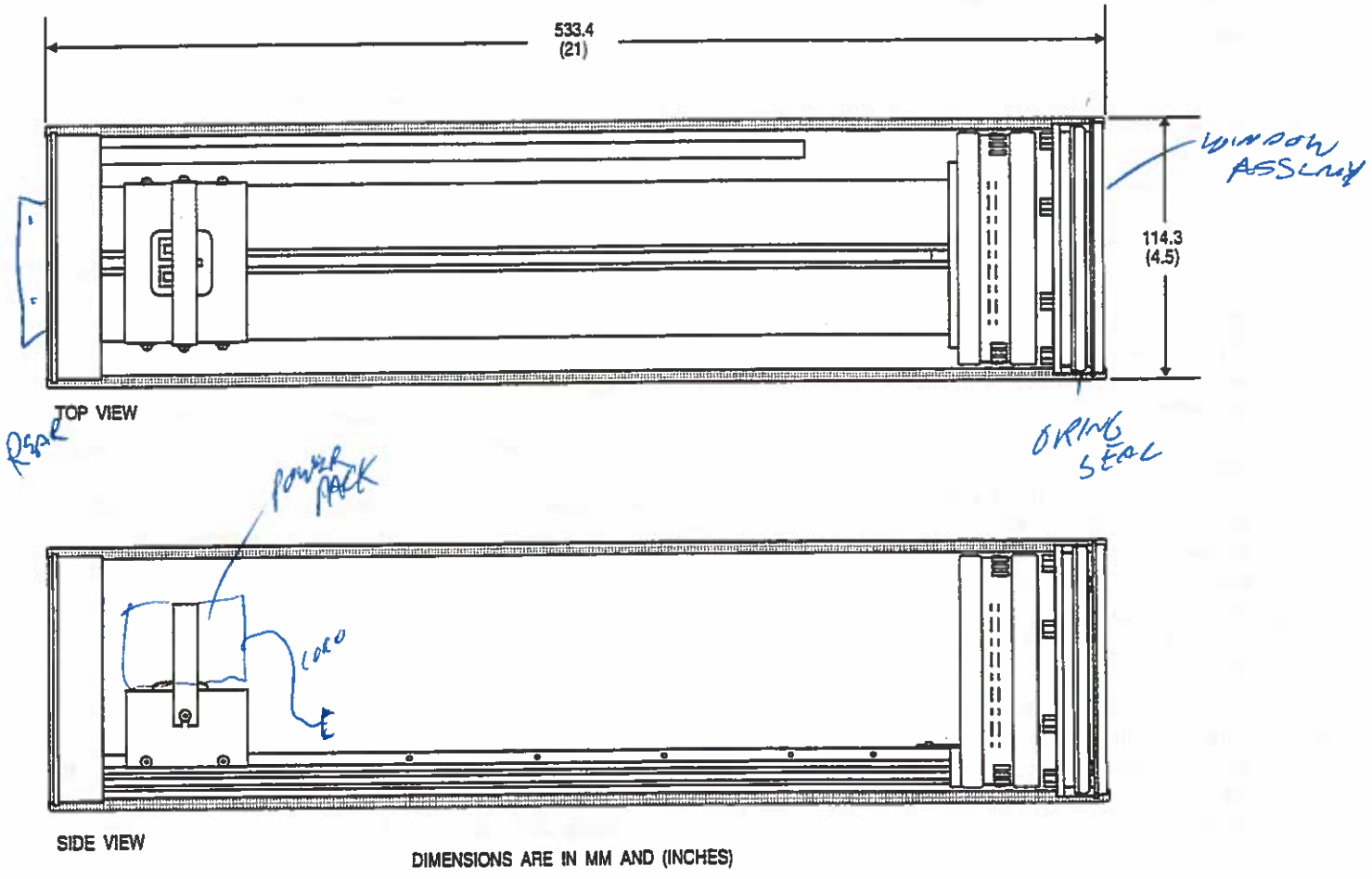

Figure 1-1. Dimensions, Housing

Table 1. Specifications

ENVIRONMENTAL	
Ambient Temperature Limits	Heater option allows operation down to -40° C (-40° F) See the appropriate Camera manual for Camera limits
Altitude	Sea level to the equivalent of 10,000 feet (3048 m) [20 inches of mercury]
Humidity	Up to 100% relative humidity
Vibration	Sine vibration from 5 to 60 Hz with 0.082 inch total excursion (15 g's at 60 Hz). Random vibration from 60 to 1000 Hz, 5 g's rms (0.027 g^2/Hz) without damage
Shock	Up to 15 g's in any axis under non-operating conditions per MIL-E-5400T, para. 3.2.24.6
Sand and Dust	MIL-E-5400T, para. 3.2.24.7
Fungus	MIL-E-5400T, para. 3.2.24.8
Salt Atmosphere	MIL-E-5400T, para. 3.2.24.9
Explosion	MIL-E-5400T, para. 3.2.24.10
MECHANICAL	
Dimensions	See figure 1-1 and 1-2
Weight (with no camera installed)	7 lb 8 oz (3.4 kg)
Housing Mount	1/4-20 threaded holes (fig. 1-2)
Cohu reserves the right to change specifications without notice	

1.2 ELECTRICAL CHARACTERISTICS

The following section contains electrical characteristics for the 4.5-inch Housing, Fiber Optic Video Output, and the Heaters. Refer to the appropriate manuals for camera and optional equipment electrical characteristics.

1.2.1 Housing

Power (12/24 V dc, or 12/24 V ac, 60 Hz) from the rear plate connector routes to the power-in connector of the camera. For 115 V ac, 60-Hz input power, a three-prong (grounded) ac receptacle is mounted on the main support rail. An optional power pack plugs into this receptacle and provides 12-V ac power to the camera power input connector.

The rear plate connector also provides a 75-ohm video output, video common (shield), ground, and various inputs/outputs for the optional equipment. See the appropriate camera manual for connector pin functions.

1.2.2 Fiber Optic Video Output

The fiber optic video output option allows the video signal to be transmitted over a fiber optic link to a compatible fiber optic receiver.

1.2.3 Heaters

This option is a thermostatically controlled heater to keep the camera above its minimum operating temperature in cold environments. The thermostat turns the heater on at approximately 4° C (40° F) and off at approximately 16° C (60° F). The heater circuit is protected by a 0.7 A slow blow fuse. This option requires 115-V ac input power.

1.3 MECHANICAL CHARACTERISTICS

This section contains mechanical characteristics for the 4.5-inch Housing, the Fiber Optic Video Output, and the Heaters. Refer to the appropriate manuals for camera and optional equipment mechanical characteristics.

1.3.1 Housing

The Housing (fig. 1-1) is a 4.5-inch (114.3-mm) diameter, sealed, pressurized cylindrical barrel which protects the camera against ambient environmental conditions typically found outdoors and in some industrial settings. It is manufactured from 6061-T6 aluminum tubing with a wall thickness of 0.25 inches. The standard length of the barrel is 21 inches (533.4 mm).

The barrel is pre-treated with a conversion coating and finished with white textured bake enamel. The barrel attaches to the mounting base with two stainless steel circular clamps. The base has three tapped 1/4-20 holes (fig. 1-2) for mounting to a pan-and-tilt unit, wall mount, or other type support.

The front end of the barrel seals with a window assembly (fig. 1-3). This assembly consists of a window of optical-quality plastic inside an aluminum plate with an O-ring seal. Another O-ring fits in a groove around the outside of the plate. An aluminum retaining ring then bolts to the plate using six 4-40 Philips screws to hold the window and outer O-ring in place. The entire assembly installs in the barrel and is held in place with a snap-ring.

The rear of the barrel seals with an aluminum plate having a groove mounted O-ring around its circumference (fig. 1-4). The rear plate is held in place with a snap-ring. Installed on this plate are the cable connector, a Schrader valve (to allow purging and pressurization of the interior of the Housing with extra dry grade nitrogen), a pressure relief valve, and, if installed, the ID generator switches and fiber optic output connector.

The rear plate also contains an interlocking pressure-relief screw. The rear snap-ring cannot be removed unless this screw is removed first. Removal of this screw depressurizes the interior of the Housing. See figure 1-5 for component locations on the rear plate.

Mounting rails for the camera bolt to the inside bottom of the rear plate. The camera bolts to the rails through a channel using two 1/4-20 bolts. If a zoom lens is installed on the camera, a mounting block underneath the camera allows it to remain level.

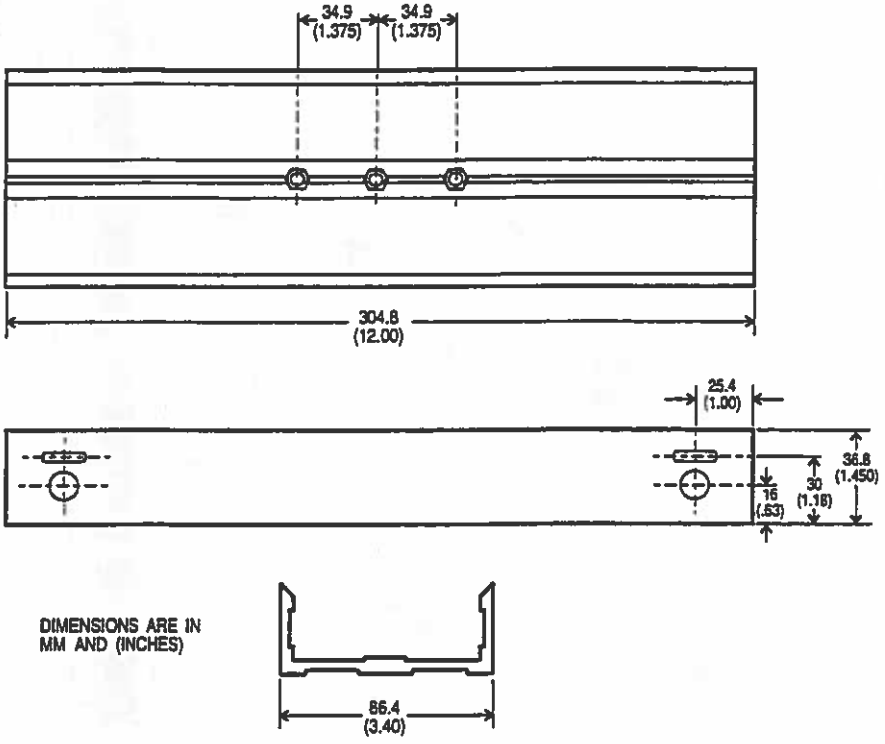

Figure 1-2. Dimensions, Mounting Base

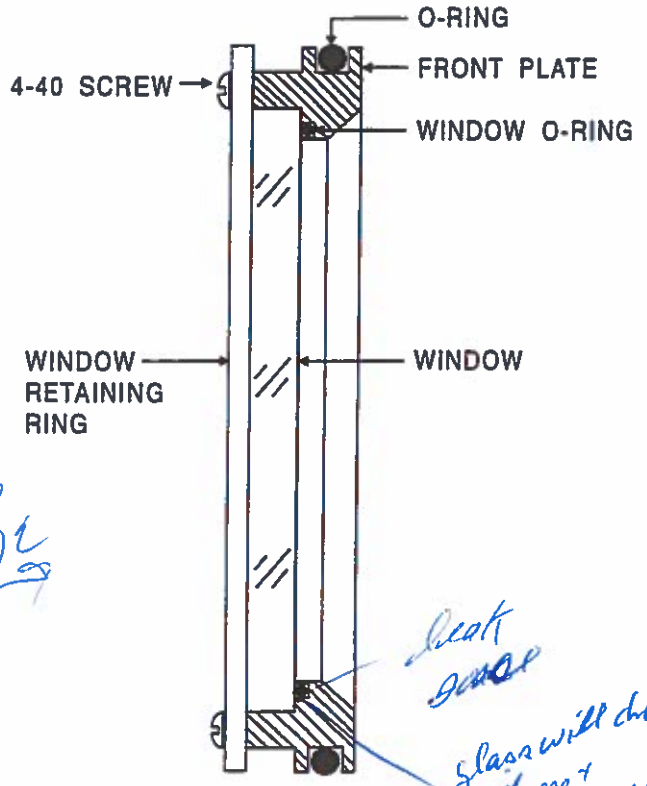

Figure 1-3. Window Assembly

3. Cable connector: Cohu p.n. 1310230-005 (Bendix PT06A-20-39S(SR))

4. Mounting hardware: (2) 1/4-20 Hex Bolts, (2) 1/4 split washers

The connector may be supplied with cables or other equipment ordered for use with the Housing.

1.5 EQUIPMENT REQUIRED BUT NOT SUPPLIED

For camera equipment required but not supplied, refer to the appropriate camera manual.

1. Interconnection cable

2. Optional equipment:

- Pressurized extra dry grade nitrogen with a Schrader valve fitting and a Schrader valve pressure gauge will be necessary to repressurize the Housing if it is opened for camera adjustments.

- Dow Corning No. 11 Silicon Lubricant or an equivalent will be required to lubricate the sealing O-rings on reassembly if the Housing is opened for camera adjustments.

1.3.2 Fiber Optic Video Output

The fiber optic video output module is mounted on the rear plate of the Housing. The output connector is located next to J1 on the rear plate. See figure 1-5 for component locations on the rear plate.

1.3.3 Heaters

The heater element attaches to an aluminum ring which surrounds the lens. The thermostat and fuse holder are mounted to the ac receptacle box at the rear of the Housing.

1.4 EQUIPMENT SUPPLIED

The following list does not include any optional or special-request items that might be included in the purchase of a Housing. For camera equipment supplied, refer to the appropriate camera manual.

1. 4.5-Inch Environmental Housing

2. 4.5-Inch Environmental Housing Installation and Operation Instructions (6X-923)

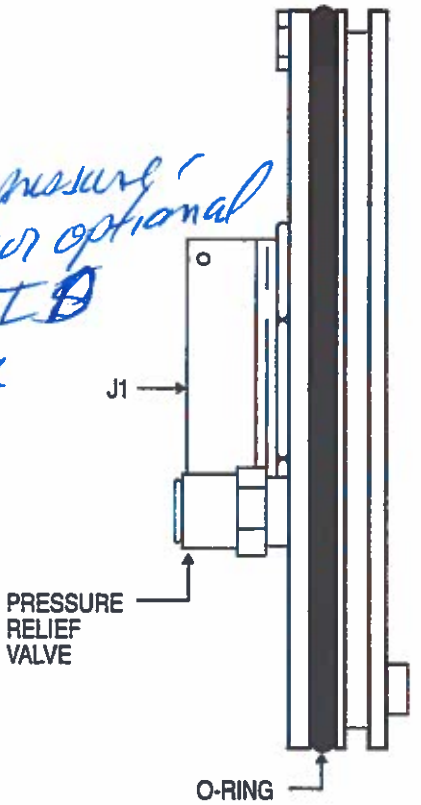

Figure 1-4. Rear Plate

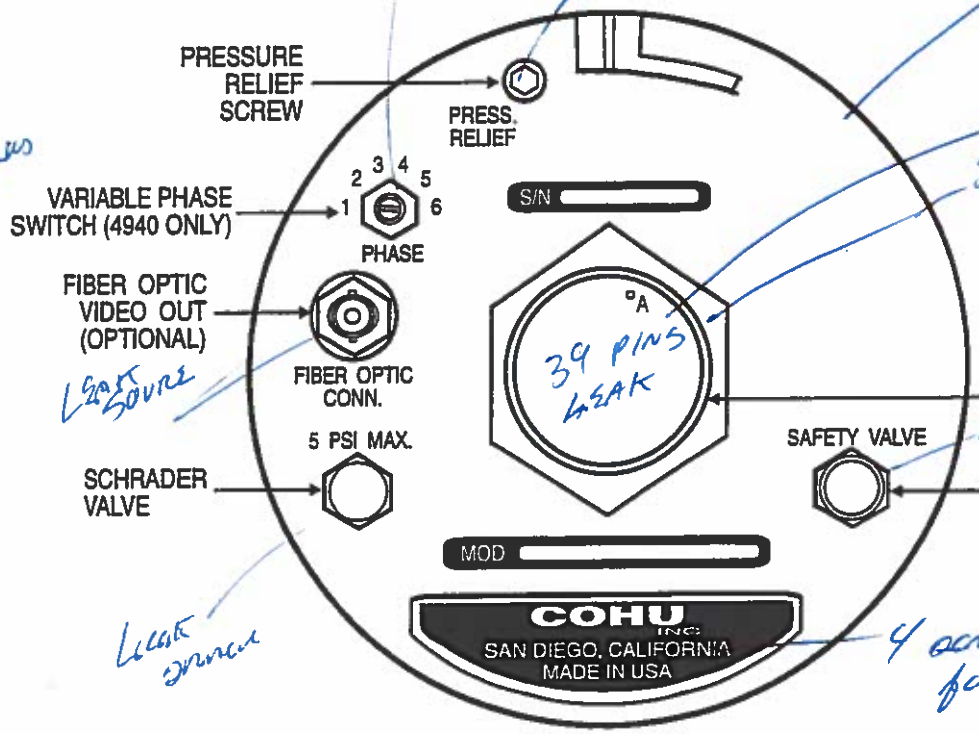

Figure 1-5. Location of Components, Rear Plate

- If the programmable alphanumeric ID generator option is installed, an ASCII terminal or a PC with an RS-232 to RS-422 converter and running a terminal emulation program is required for programming.
- If a zoom lens is installed, a compatible remote control is required to operate the lens.
- If the fiber optic video output option is installed, a 50- or 62.5-micron fiber optic cable with ST or SMA connector is required.
- If the heater option is installed, 115-V ac 60-Hz power is required.

SECTION II
INSTALLATION

2.1 INTRODUCTION

This section contains installation procedures for the Housing. Refer to the appropriate camera or optional equipment manuals for their installation procedures.

Be aware that the Housing must be opened to make any installation adjustments on the camera or lens. Proper procedures for removal and replacement of the camera in the housing must be followed. These procedures can be found in section 5.8.

2.2 UNPACKING AND RECEIVING INSPECTION

This item was thoroughly tested and carefully packed in the factory. Upon acceptance by the carrier, they assume responsibility for its safe arrival. Should you receive this item in a damaged condition, apparent or concealed, a claim for damage must be made to the carrier.

If a visual inspection shows damage upon receipt of this shipment, it must be noted on the freight bill or express receipt and the notation signed by the carrier's agent. Failure to do this can result in the carrier refusing to honor the claim.

When the damage is not apparent until the unit is unpacked, a claim for concealed damage must be made. Make a mail or phone request to the carrier for inspection immediately upon discovery of the concealed damage. Keep all cartons and packing materials. Since shipping damage is the carrier's responsibility, the carrier will furnish you with an inspection report and the necessary forms for filing the concealed-damage claim.

2.3 INSTALLATION PROCEDURE

Installation should pose no particular problems. Always plan all cable runs in advance. Threaded 1/4-20 holes are provided on the centerline of the mounting base (fig. 1-2). Use 1/4-20 bolts to install the Housing at the desired location.

To adjust the barrel rotational position, loosen (but do not remove) the two clamps securing the barrel to the mounting base using a flat-blade screwdriver. Access holes are provided in the mounting base. Rotate the barrel to the desired position and tighten the clamps.

2.3.1 Power Connections

The camera in the Housing typically requires either 12-/24-V dc/ac, 60-Hz, or 115-V 60-Hz ac power. If the heater option is installed, 115-V 60-Hz ac power is required. See the appropriate camera manual for rear plate connector J1 pin functions.

CAUTION

Do not allow voltage excursions outside the recommended operating range of the heaters (103.5 to 126.5 V ac). Refer to the appropriate camera manual for camera voltage requirements.

2.3.2 Video Connections

A 75-ohm video output is provided at rear plate connector J1. See the appropriate camera manual for J1 pin functions.

If the fiber optic video output option is installed, connect a fiber optic cable to the fiber optic connector on the rear plate.

2.4 PREPARATION FOR SHIPMENT AND STORAGE

For shipment, package with enough foam padding or other packing material to prevent damage that can occur during shipping. The original shipping carton is a good container if it has not been damaged or subjected to excessive moisture.

For shipping to the factory by Common Carrier, use 5755 Kearny Villa Road, San Diego, CA 92123 as the address. Please contact the Customer Service Department for a Return Authorization (RA) number before sending any shipments to the factory.

SECTION III
OPERATION

3.1 OPERATING PROCEDURES

There are no operating procedures associated with the Housing. Refer to the appropriate manuals for camera and optional equipment operating procedures. Be aware that the Housing must be opened to make any operational adjustments on the camera or lens. Proper procedures for removal and replacement of the camera in the housing must be followed. These procedures can be found in section 5.8. It is recommended that only qualified personnel familiar with camera maintenance perform these procedures.

SECTION IV
CIRCUIT DESCRIPTIONS

4.1 INTRODUCTION

No circuit descriptions are necessary for the Housing. See the appropriate camera or optional equipment manual for circuit descriptions for those items.

SECTION V
MAINTENANCE

5.1 INTRODUCTION

This section contains procedures for maintaining the Housing and removing and installing a camera in the Housing. Refer to the appropriate option board manual for procedures for removing and installing the option boards in the Housing.

Only technically qualified personnel familiar with television camera maintenance should attempt the procedures in this section.

WARNING!

Housings are pressurized with dry nitrogen. Do not attempt to disassemble the Housing until after releasing pressure. Use the Schrader valve or the pressure relief valve on the rear plate to release the pressure.

WARNING!

An interlocking pressure-relief screw in the rear plate must be removed before disassembly. This acts as a fail-safe to allow the pressure to release. This screw could act as a projectile under Housing internal pressure.

5.2 STATIC DISCHARGE PROTECTION

Components used in modern electronic equipment are susceptible to damage from static discharge. The relative susceptibility to damage for semiconductors varies from low with TTL to high with CMOS. Most other semiconductors fall between TTL and CMOS in susceptibility to static discharge.

As a minimum, therefore, observe the following practices when working inside this or any other electronic equipment:

1. Use conductive sheet stock on the work bench surface.

2. Verify that the sheet stock is connected to ground through an approximate 1 megohm resistor.

3. Use a wrist strap connected to ground through an approximate 1 megohm resistor when working at the bench.

4. Maintain relative humidity of the room above 30 percent. This may require a room humidifier. Working on circuits when relative humidity is below 30 percent requires extra procedures not listed here.

5. Use anti-static bags to store and transport an exposed chassis, circuit boards, and components. Use new anti-static bags. Old, used bags lose their static protection properties.

This list serves as a reminder of the minimum acceptable practices. Be sure that all static discharge devices at the work bench are properly installed and maintained.

WARNING!

The leads for the sheet stock on the work bench and the wrist strap must have a resistor in the megohm range inserted in series. This prevents the person at the bench from being directly grounded. The resistor limits current to a safe value if dangerous voltage is contacted.

Standard grounding sheets and wrist straps purchased for use at work benches are supplied with leads having the required current limiting resistors for safety. Never substitute a lead that does not have a resistor.

5.3 TEST EQUIPMENT REQUIRED

The following equipment is required for disassembly and reassembly of the Housing:

1. Extra dry grade pressurized nitrogen
2. Dow Corning No. 11 Silicon Lubricant or equivalent
3. Schrader valve fitting
4. Schrader valve pressure gauge
5. Standard hand tools

A DMM would be helpful in troubleshooting a defective Housing (checking cable connections, checking for ac power, etc.).

5.4 CLEANING AND LUBRICATION

Interior areas within the Housing do not require cleaning unless the sealed enclosure has been depressurized and left open. As long as a Housing is sealed and pressurized, negligible accumulation of dust or other contaminants can occur. However, when the enclosure is opened the inside surface of the Housing, interior circuit areas, and exposed glass surfaces on the lens and optical window should be cleaned before reassembly.

5.4.1 Lens and Optical Window Cleaning

The optical surfaces of the lens and the window can be cleaned by standard procedures use to clean optical assemblies. Lens surfaces may be cleaned by wiping gently with a cotton swab soaked in methyl alcohol. Never rub with a dry cloth or swab.

5.4.2 Housing Cleaning

The heat-reflective outer surface of the Housing assembly should be cleaned periodically if installed in a location where film buildup occurs. Use a soft cloth and mild soap solution.

5.4.3 Lubrication

The only lubrication required for this Housing is on the O-ring seals. Use Dow Corning No. 11 Silicon Lubricant or an equivalent. Use of an improper lubricant on the O-ring seals can cause deterioration or failure to hold pressure.

5.5 DESICCANT PACK DRYING

The packs must be completely dry when installed in the Housing. If they are dried before the Housing is ready for sealing, store the packs in a sealed glass jar or similar container. To dry desiccant packs, proceed as in step 1 below.

1. In a conventional oven, dry the packs at a temperature between 245 to 260 °F (118 and 127 °C) for 12 hours minimum. Allow the packs to cool before handling.

5.6 RELATIVE HUMIDITY INDICATOR

A humidity indicator card is located in the barrel and is visible through the window. Three circles on this card represent 10, 20, and 30 percent relative humidity. The circles are blue if relative humidity is below 10 percent. If humidity goes above the indicated percentage, the circle will turn pink. The interior of a sealed Housing should have relative humidity of less than 10 percent to prevent the window from fogging inside.

Extra dry grade nitrogen is made to flow through the Housing when it is sealed. This forces out air, which contains water vapor that can condense on the window when temperature inside the barrel drops. Nitrogen flowing through the Housing also strips moisture from surfaces inside the Housing. Desiccant packs in the Housing then absorb and hold any remaining moisture to maintain a relative humidity below 10 percent.

If the nitrogen leaks from a Housing, heating and cooling through normal daily cycles can cause outside air to be drawn into the Housing through the escape route of the nitrogen. Water vapor in this air will condense with cool temperatures. This coats the inside of the window, effectively blinding the camera.

Occasional inspection of the nitrogen pressure will verify that it is being maintained above atmospheric pressure. Any Schrader valve pressure gauge capable of measuring from 0 to 10 psi (0 to 60 kPa) is sufficient for measuring Housing pressure. Occasional addition of nitrogen, if required, can prevent outside air from entering the barrel. If the pressure leaks down on a regular basis the Housing may have to be disassembled and resealed.

5.7 PERFORMANCE TESTS

The amount and type of testing that can be performed on a Housing depends on how accessible it is. If mounted high up on a pole, checking the moisture indicator and nitrogen pressure may be difficult. If the Housing is on a test bench, complete testing will be simplified. Perform the following tests as desired:

1. Determine if the barrel and window require cleaning.

2. Look at the humidity indicator inside the window and verify that all three circles are still blue, indicating that relative humidity in the Housing is below 10 percent.

3. Test the nitrogen pressure to see if 5 psi (34 kPa) of pressure is being maintained. (If it is known that the Housing is holding pressure, allowing less than this value is acceptable. As long as the Housing maintains pressure just slightly above atmospheric pressure, problems with internal water vapor cannot occur. Be sure it is nitrogen and not heated air that is maintaining a slight pressure. If air enters the Housing, the humidity indicator will indicate that moisture exists in the Housing.)

5.8 CAMERA REMOVAL AND REPLACEMENT

WARNING!

Always remove power before removing the camera from the Housing.

WARNING!

Housings are pressurized with extra dry grade nitrogen. Do not attempt to disassemble the Housing until after releasing pressure. Use the Schrader valve or the pressure relief valve on the rear plate to release the pressure.

NOTE

The desiccant packs must be dried or replaced with new, dry packs when a Housing has been opened for any reason. The interior of the newly assembled Housing must then be purged with extra dry grade nitrogen and repressurized.

5.8.1 Barrel Removal from Mounting Base

If desired, the barrel can be removed from the mounting base to allow the base to remain secured in its position. To remove the barrel, proceed as follows:

1. Remove the rear plate connector cable and, if necessary, the fiber optic cable.

2. Loosen (but do not remove) the two hose clamps securing the barrel to the mounting base using a flat-blade screwdriver (access holes are provided in the mounting base).

3. Slide the barrel clear of the mounting base and clamps.

5.8.2 Camera Chassis Removal from Housing

The environmental Housing is a 4.5-inch (114-mm) diameter barrel. It is closed at the front by a window assembly and at the back by a round aluminum plate. Both ends of the housing assembly are sealed by O-rings. Snap-rings contain each end of the housing.

Proceed as follows to remove the camera chassis from its housing:

1. Remove all electrical power to the rear plate connector.

2. Unplug the rear plate connector cable(s).

3. Release internal pressure using the Schrader valve or the pressure relief valve on the rear plate.

4. Remove the snap-ring interlock pressure-relief screw in the rear plate.

5. Remove the rear snap-ring.

6. Slide the camera chassis to the rear until it is free of the barrel. (The rear plate forms a tight seal inside the barrel. Force will be necessary to remove it. Attach a cable assembly to the rear plate connector to aid in removing the chassis.)

5.8.3 Window Assembly Removal from Housing

1. Remove the snap ring from the front of the Housing. Use care to avoid scratching the window.

2. Reach inside the Housing and press around the circumference of the window assembly until it is free of the Housing.

5.8.4 Camera Removal and Replacement

1. Remove all cables from the camera rear plate.

2. Remove the two 1/4-20 bolts from the bottom of the chassis and remove the camera.

3. Refer to the appropriate camera manual for any required maintenance procedures.

4. Place the camera on the mounting rails and install the 1/4-20 bolts.

5. Plug the cables into their appropriate jacks.

5.8.5 Camera Chassis Installation in Housing

1. Refer to section 5.4.2. Also clean the inside surface of the barrel assembly.

2. Refer to section 5.4.1. Clean and inspect:

   a. The O-ring. Inspect for damage or deterioration. Replace damaged or deteriorated parts.

   c. The rear plate O-ring groove. Check for scratches or dents. Be sure the grooves are clean and free of any foreign material.

3. Install the newly dried desiccant packs on the chassis using a tie-wrap to hold them in place.

4. Lightly coat the rear plate O-ring with Dow Corning No. 11 silicon lubricant.

5. Install the O-ring in the groove on the rear plate.

6. Slide the camera chassis into the Housing until the rear plate is clear of the snap-ring groove in the rear of the Housing.

7. Install the rear snap-ring. Use a large pair of slip joint pliers to fully seat it, if required. The jaw that will press on the outside surface of the barrel should be wrapped with several layers of tape to prevent scratching the paint. Press the snap-ring firmly into the groove in the barrel until it is evenly seated on all sides.

8. Install the snap-ring interlock screw in the rear plate.

5.8.6 Window Assembly Replacement in Housing

1. Refer to section 5.4.1. Clean and inspect:

   a. The optical window. Inspect for scratches, cracks, or other deterioration. Replace if required. Wrap the window in tissue after completion of the cleaning process to protect from dirt and other contaminants until ready for installation.

   b. The two O-rings. Inspect for damage or deterioration. Replace damaged or deteriorated parts.

   c. The front plate O-ring grooves. Check for scratches or dents. Be sure the grooves are clean and free of any foreign material.

2. Lightly coat the two front plate O-rings with Dow Corning No. 11 silicon lubricant.

3. Install the O-rings in the grooves on the front plate.

4. Install the window assembly in the front of the Housing. Press the assembly in until it contacts the raised inner portion of the barrel.

5. Install the front snap-ring. Use a large pair of slip joint pliers to fully seat it, if required. The jaw that will press on the outside surface of the barrel should be wrapped with several layers of tape to prevent scratching the paint. Press the snap-ring firmly into the groove in the barrel until it is evenly seated on all sides.

WARNING!

Nitrogen is an inert gas. When used in an enclosed area it can displace the oxygen, causing loss of consciousness and life.

6. Flow extra dry grade nitrogen through the Housing by applying about 10 psi (69 kPa) of pressure to the Schrader valve. Allow the nitrogen to flow through the Housing and out of the pressure-relief valve (the valve must be held open) for several minutes or until the three humidity-indicator rings are blue.

7. Release the pressure-relief valve and pressurize the Housing with extra dry grade nitrogen to 5 psi (34 kPa).

8. Test the camera and Housing for proper performance. Correct any problems before continuing.

9. Return the Housing to service.

5.8.7 Barrel Replacement on Mounting Base

To replace the barrel on the mounting base (if necessary), proceed as follows:

1. Slide the barrel through the clamps and position on the mounting base.

2. Rotate the barrel to the desired position and tighten the clamps using a flat-blade screwdriver (access holes are provided in the mounting base).

SECTION VI
PARTS LISTS

6.1 PARTS LIST USE

Parts appear in the reference designation order. This system of identification places assemblies and components in order by alphabetical and numeric designations.

Unused reference designations are not listed; thus, notations such as Not Used do not appear in a parts list sequence where reference designations are skipped.

Included in the parts list are electrical components (capacitors, resistors, ICs, etc.) together with closely associated parts such as connectors, IC sockets, and fuses. Mechanical parts subject to wear, damage, or loss in normal use appear in the lists, too.

All parts are identified by name and description together with a company part number. Transistors, diodes, ICs, and similar parts may also be identified by the name and part number of a particular manufacturer. Equivalent parts from other manufacturers may be substituted; however, if the designation "only" appears together with the manufacturer and part number reference, no substitution should be made. Only the exact part from that manufacturer is acceptable. In all cases, though, the company part number can be used to order the part from either the factory or from an authorized representative.

Table 6-1. Parts List, Type 8418001-003 Housing Kit Installation

REF DESIG	DESCRIPTION	PART NUMBER
	FROM ISSUE 3	
J2	Connector, Ac Receptacle, 3-Wire Grounding	1710394-001
	Barrel, 21 in.	8418203-121
	Rail Extrusion, Left	8418204-005
	Rail Extrusion, Right	8418204-006
	Box, Receptacle	8418215-001
	Screw, Receptacle Box, Pan Head, 4-40 x 1/4 (quantity of 4 required)	2010351-004
	Bracket, Power Pack	8418216-001
	Screw, Power Pack Bracket, Pan Head, 6-32 x 1/4 (quantity of 2 required)	2010352-004
	Window	2710071-001
	Window Frame	8418205-001
	O-Ring, Window	0310063-043
	Screw, Window Retainer Ring, Truss Head, 4-40 x 3/8 (quantity of 6 required)	2010570-022
	Ring, Window Retainer	8418207-001
	O-Ring, Window Assembly	0310063-241
	Ring Support	8418212-001
	Screw, Ring Support, Filister Head, 10-32 x 3/4 (quantity of 4 required)	2010699-001
	Finger Strip	2710002-006
	O-Ring, Finger Strip	0310063-153
	Indicator, Humidity	0390071-002
	Stand, Humidity Indicator	8418010-001
	Screw, Humidity Indicator Stand, Pan Head, 4-40 x 1/4 (quantity of 2 required)	2010351-004
	Screw, Camera Mount (Auto-iris lens), Truss Head, 1/4-20	0310026-353
	Lockwasher, Star, 1/4	0310015-023
	Base, Mounting	8418218-001
	Bolt, Base Mount, Hex Head, 1/4-20 x 3/4	0310124-006
	Lockwasher, Spring, 1/4	0310014-017
	Clamp, Adjustable (quantity of 2 required)	2010253-004
	Snap Ring	2010588-007
	Swage Nut	2010348-005
	Pin, Spring	2010700-001
	Dessicant (quantity of 2 required)	2510052-001
	Tubing, Purge Valve, 15 in.	2710017-005
	Cover, Protective	5410047-007
	Nameplate, COHU, Right Side	9500038-001
	Nameplate, COHU, Left Side	9500038-002
	Nameplate, COHU, Mounting Base	9500040-001

Table 6-2. Parts List, Type 8418305-001 and -003 Rear Plate Kit (8240 Series)

REF DESIG	DESCRIPTION	PART NUMBER
	FROM ISSUE 6	
E1	Lug, Solder	1702528
E2	Lug, Solder	1702528
J1	Connector, Rear Plate (Amphenol PT07C-20-39P)	1310225-004
J6	Connector, Heater Power, 2 Contact	1310288-014
	Contact, Female, for J6 (quantity of 2 required)	1310288-106
J42	Connector, Zoom Lens Follower Pots, 6 Contact	1310288-008
	Contact, Female, for J42 (quantity of 4 required)	1310288-104
P10	Connector, BNC [1]	1310212-004
P58	Connector, Mini DIN, 8 Contact	1310373-108
P74	Connector, Low Profile, 5 Contact	1310355-105
P81	Connector, 8 Contact	1310315-248
	Key, for P81-4	1310315-151
P91	Connector, Low Profile, 2 Contact	1310355-102
P92	Connector, Low Profile, 2 Contact [1]	1310355-102
P501	Contact for P74, P91, and P92 (order quantity required)	1310355-001
R3	Resistor, Carbon Film, 75 ohm, 5%, 1/4 W	4010025-750
	Rear Plate	8418209-101
	Rear Plate [1]	8418209-103
	O-Ring, Rear Plate	0310063-242
	Snap Ring	2010588-007
	Access Plate	9500039-001
	Screw, Fillister Head, 10-32 x 3/4 (quantity of 4 required)	2010699-001
	Screw, Pressure Relief, Socket Head, 10-32 x 1/4	2010131-061
	O-Ring, Pressure Relief Screw	2010697-001
	Valve, Schrader	2010433-011
	Cap, Schrader Valve,	2010433-002
	Valve, Pressure Relief	2010652-002
	Transmitter, Fiber Optic [1]	3200002-001
	Cable, Subminax Coax, 75 Ohm [1]	7610066-001
	Label, Serial Number	9510045-001
	Label, Model Number	9510045-002

Note:
1 = Fiber Optic Video Output option only (-003)

Table 6-3. Parts List, Type 8344205-001 through -008 Rear Plate Kit (4940 Series)

REF DESIG	DESCRIPTION	PART NUMBER
	FROM ISSUE 1	
E1	Lug, Solder	1702528
E2	Lug, Solder	1702528
J1	Connector, Rear Plate (Amphenol PT07C-20-39P)	1310225-004
J6	Connector, Heater Power, 2 Contact	1310288-014
	Contact, Female, for J6 (quantity of 2 required)	1310288-106
J42	Connector, Zoom Lens Follower Pots, 6 Contact	1310288-008
	Contact, Female, for J42 (quantity of 4 required)	1310288-104
P10	Connector, BNC [1]	1310212-004
P21	Connector,	1310373-108
P74	Connector, Low Profile, 5 Contact	1310355-105
P81	Connector, 8 Contact	1310315-248
	Key, for P81-4	1310315-151
P91	Connector, Low Profile, 2 Contact	1310355-102
P92	Connector, Low Profile, 2 Contact [1]	1310355-102
P97	Connector, Low Profile, 3 Contact	1310355-103
P501	Contact for P74, P91, and P92 (order quantity required)	1310355-001
R3	Resistor, Carbon Film, 75 ohm, 5%, 1/4 W	4010025-750
	Rear Plate [2 & no options]	8418209-101
	Rear Plate [1]	8418209-102
	Rear Plate [1,2]	8418209-104
	Rear Plate [3]	8418209-105
	Rear Plate [1,3]	8418209-106
	Rear Plate [2,3]	8418209-107
	Rear Plate [1,2,3]	8418209-008
	Switch and Cable Assembly, Variable Phase [3]	8344605-001
	O-Ring, Rear Plate	0310063-242
	Snap Ring	2010588-007
	Access Plate	9500039-001
	Screw, Fillister Head, 10-32 x 3/4 (quantity of 4 required)	2010699-001
	Screw, Pressure Relief, Socket Head, 10-32 x 1/4	2010131-061
	O-Ring, Pressure Relief Screw	2010697-001
	Valve, Schrader	2010433-011
	Cap, Schrader Valve,	2010433-002
	Valve, Pressure Relief	2010652-002

Table 6-3. Parts List, Type 8344205-001 through -008 Rear Plate Kit (4940 Series) (continued)

REF DESIG	DESCRIPTION	PART NUMBER
	O-Ring, Variable Phase Switch [3]	0310063-010
	Transmitter, Fiber Optic [1]	3200002-001
	Cable, Subminax Coax, 75 Ohm [1]	7610066-001
	Label, Serial Number	9510045-001
	Label, Model Number	9510045-002

Note:
1 = Fiber Optic Video Output option only
2 = ID Generator option only
3 = Variable Phase option only

Table 6-4. Parts List, Type 8344605-001 Variable Phase Switch and Cable Assembly (4940 Series)

REF DESIG	DESCRIPTION	PART NUMBER
	FROM ISSUE 1	
P99	Connector, 8 Contact	1310355-108
P501	Contact for P99 (quantity of 6 required)	1310355-001
S1	Switch, Rotary, Slotted Shaft	6210178-001

Table 6-5. Parts List, Type 8418901-001 115 Vac Heater Kit Installation

REF DESIG	DESCRIPTION	PART NUMBER
	FROM ISSUE 3	
F1	Fuse, Slow Blow, 250 V, 0.7 A	1710360-017
P6	Connector, Heater Power, 2 Contact	1310288-013
P501	Contact, Male, for P6 (quantity of 2 required)	1310288-105
R1	Resistor, Power, Thermofoil Heater, 115 V, 50 W	5110049-001
RT1	Thermostat, 40° F Close, 60° F Open (±5°), 120 V, 6 A	1710369-001
XF1	Fuse Block	1710396-001
	Fuse Cover	2010459-002
	Screw, Fuse Block, Captive Washer, Pan Head, 4-40 x 1/4	2010351-004
	Screw, RT1, Nylon, Binding Head, 4-40 x 5/16 (quantity of 2 required)	2010169-005
	Washer, RT1, Nylon, Flat (quantity of 2 required)	2010211-018

Table 6-6. Parts List, Type 8418601-001 6:1 Zoom Lens Kit Installation

REF DESIG	DESCRIPTION	PART NUMBER
	FROM ISSUE 3	
	Block, Mounting	8418606-002
	Screw, Self-locking, 1/4-20 x 1 in.	2010710-001

Table 6-7. Parts List, Type 8418701-001 10:1 Zoom Lens Kit Installation

REF DESIG	DESCRIPTION	PART NUMBER
	FROM ISSUE 4	
	Block, Mounting	8418606-001
	Screw, Self-locking, 1/4-20 x 1 5/16 in.	2010710-002