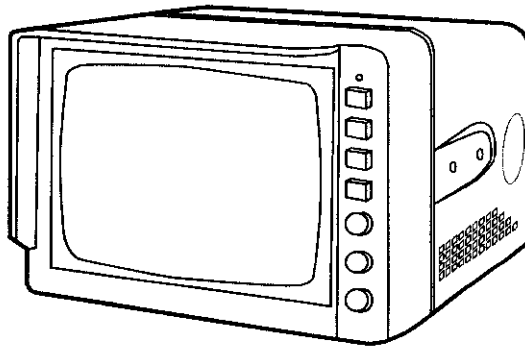




BACKUP MONITORING SYSTEM

FOR RVS, MOTORHOMES, TRUCKS, BUSES, AND BOATS
INSTALLATION AND OPERATION
(STS5BW)



1. FEATURES

Monitor

The black and white monitor is designed for automotive rear view system.

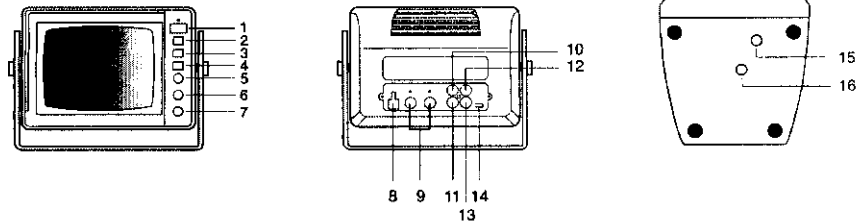
- You can use the monitor by a 12V~24V car battery.
- The monitor is automatically turned on when you set the change lever in the R(reverse) position.
- This system features one way Audio.
- Optionally two cameras are available.

Camera

The black and white camera is designed for automotive rear view system to provide the driver with a view of the rear of vehicle.

- You can use the camera by a 12V.
- The camera is automatically turned on when the monitor is turned on.
- The camera utilizes a CCD image sensor having a high quality picture.
- The camera automatically adjusts the picture quality with changing in light.
- Wide field of view:
 - 120 degree in the diagonal plane.
 - 96 degree in the horizontal plane.
 - 72 degree in the vertical plane.
- Waterproof housing.
- Operates over a wide temperature range.

2. MONITOR CONTROLS



1) POWER SWITCH

- Press the power switch (**ON**) to turn the monitor ON.
(The green LED indicator will illuminate).
- Press the power switch again to turn the monitor OFF(**STAND BY**)
(The green LED indicator will not extinguish).
- The monitor is in the stand by condition.

2) CA/AV SWITCH

- Depress the CA/AV switch (**OFF**) to select the camera.
- Press the CA/AV switch (**ON**) to select the AV in.

3) CAMERA SELECTOR

- Depress the camera selector (**CA1**) to select the camera connected to the Camera 1.
- Press the camera selector (**CA2**) to select the camera connected to the Camera 2.

4) DAY/NIGHT SWITCH

- Normally this switch should be in the out position (**DAY**).
When you view the picture at night or in a tunnel etc., depress the switch to reduce the picture brightness (**NIGHT**).

5) AUDIO CONTROL SWITCH

- Adjust the audio volume for the desired level.
Turn clockwise to increase audio volume and counterclockwise to decrease it.

6) CONTRAST CONTROL

- Adjust the contrast control for the desired overall best picture.
Turn clockwise to increase picture contrast and counterclockwise to decrease it.

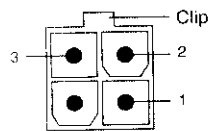
7) BRIGHT CONTROL

- Adjust the bright control for the best overall picture or display brightness.
Turn clockwise to increase picture brightness and counterclockwise to decrease it.

8) POWER CONNECTOR

- Insert the supplied power cable connector firmly until it is locked.
To remove the power connector, press in the clip and pull out the connector, while holding the clip down.

- Power connector pin description.



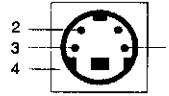
Pin No.	Description
1	Red : positive power (DC12V or 24V)
2	Green: R(reverse) gear power(DC12V or 24V)
3	Black : ground

9) CAMERA INPUT CONNECTOR

There are two mini DIN type connectors for the video camera inputs.
Connect the black and white video camera to the monitor with the supplied cable.
The monitor supplies power to the camera.
• Camera input connector pin description.

10) AUDIO OUTPUT CONNECTOR

Connects audio to a second monitor or VCR input with a conventional RCA phone type connector cable.



Pin No.	Description
1	Video output
2	Audio
3	DC 12V power
4	Ground

11) VIDEO OUTPUT CONNECTOR

Connects video to a second monitor or to a VCR


12) AUDIO INPUT CONNECTOR


Connects audio input from extra audio out.

13) VIDEO INPUT CONNECTOR

Connects video input from extra video out.

14) MIR/NOR SWITCH

When the switch is in MIR () position, the picture will reversed.

When the switch is in NOR () position, the picture will be normally displayed.

15) V-HOLD (vertical hold) control

When the picture rolls up or down on the screen, adjust V-HOLD control with "-" driver until there is a single steady picture.

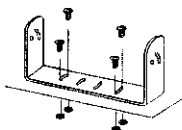
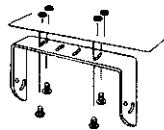
16) H-HOLD (horizontal hold) control

When the picture has slanting horizontal bars, rotate the H-HOLD control in either direction with "-" driver until a stationary picture is obtained.

3 . MONITOR INSTALLATION

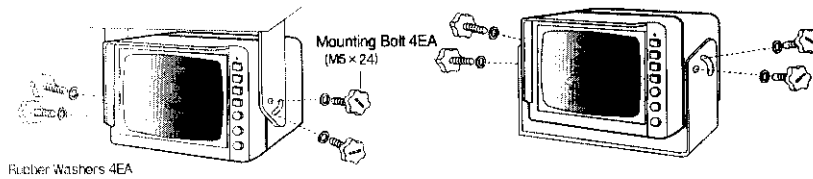
- Install the monitor on a surface which will support more than 4kg (10Lbs) of weight.
- Install the monitor away from a speaker mounted in the vehicle so that the picture is not distorted by the speaker's magnetic field.
- Do not install the unit in an extremely hot or humid place (radiator, air duct, etc.) or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- The monitor is not designed for waterproof.

a) Attach the supplied mounting bracket to the ceiling or the floor, etc.

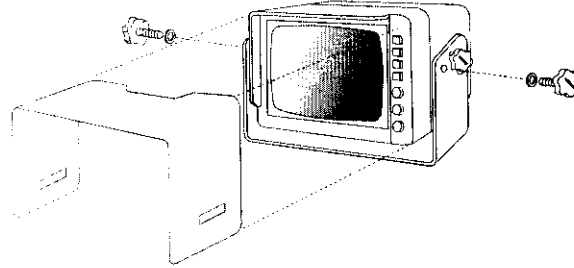


Taping screw or
Machine screw with Nut.
(\varnothing 5 × 15 or M5 × 15)

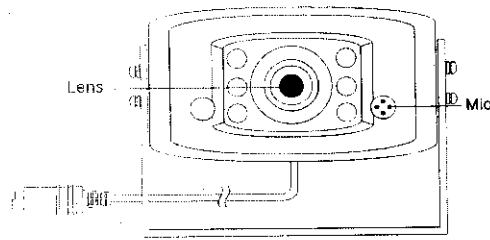
b) Adjust the angle of the monitor and fasten the screws firmly.



c) Install the sunshield by removing the bracket bolts.
Position the sunshield over the monitor aligning the holes in the sunshield and the monitor. Replace the mounting bracket bolts.



4 . CAMERA CONTROLS



• CAMERA CONNECTOR



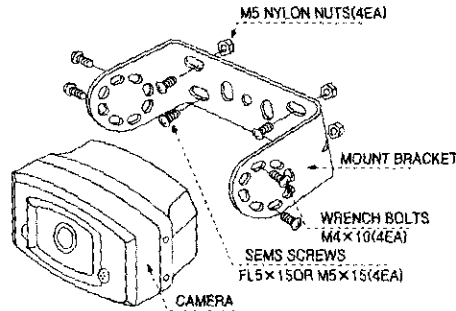
Pin No.	Description
1	Video output
2	Audio
3	DC 12V power
4	Ground

- (1) Never loosen the screws on the camera or take the camera apart.
Doing so may reduce water resistance and lead to malfunctioning.
- (2) Never swing the camera by its cable or pull strongly on the cable.
Doing so can reduce water resistance, damage the cable,
and otherwise impair camera performance.

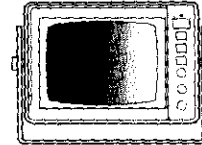
- (3) Be sure to use, etc., to the holes used to install the camera mounting on the car, bolts, and the cable holes.
- (4) Always use the included M4 x 10 pan bolts and stainless steel washers to install the camera. If you lose them, be sure to replace them with M4 x 10 pan bolts and washers. Never use longer bolts. Using longer bolts will damage the threads.
- (5) Camera connector.

5 . CAMERA INSTALLATION

a. Attach the supplied mounting bracket to the vehicle. Adjust the angle of the camera and fasten the screws firmly.

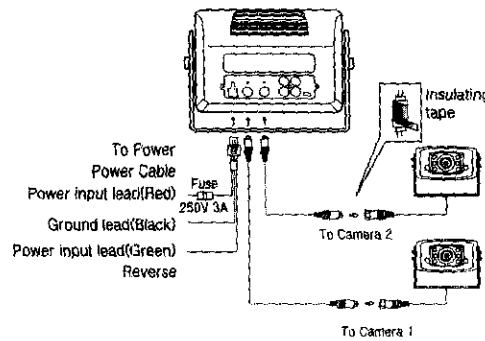


b. Run the cable from the monitor to the camera.



Protect the cable by using conduit or running the cable inside the vehicle as much as possible

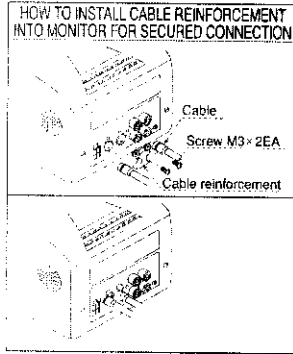
6 . CONNECTIONS



Connect the RED wire to the Positive (12V or 24V DC) power terminal which is energized with the ignition key in the accessory position.

Connect the BLACK wire to a metal point of the car or the negative battery post.

Connect the GREEN wire to the switched power output terminal of the "R"(reverse) gear.



Caution



Before making the connection, disconnect the ground terminal of the car battery to avoid short circuiting.



The plugs should be fully inserted into the connectors or jacks. A loose connection may cause malfunction of the unit.

7. OPERATING INSTRUCTIONS

- When you turn the ignition key to the Accessory or ON position, the power is supplied to the monitor and the monitor is in S/B.

Note the power of the monitor:

When you push the power switch on the S/B position, the monitor is placed in a S/B mode. The monitor is not turned off until the ignition key is on the off position.

When you set the gear lever to the Reverse position, the monitor is turned on and the picture from the camera 1 appears.

8. CLEANING AND GENERAL MAINTENANCE

- If your vehicle has been parked in direct sun light resulting in a considerable rise in temperature inside the vehicle, allow the unit to cool off before operating.
- Clean the unit with a slightly damp soft cloth. Use a mild household detergent. Never use strong solvents such as thinner or benzine as they might damage the finish of the unit.

(1) CLEANING

Unplug or power off mode before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

(2) VENTILATION

Holes in the cabinet and of the back or bottom are provided for ventilation, and to ensure reliable operation of the monitor equipment by protecting from overheating. These holes must not be blocked or covered.

(3) OBJECT AND LIQUID ENTRY

Never push objects of any kind into this monitor equipment through holes as they may touch dangerous voltage points or short-out parts this could result in a fire or electric shock. Never spill liquid of any kind on the product.

(4) SERVICING

Do not attempt to service this system by yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

9 . FCC COMPLIANCE STATEMENT

- NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

- CAUTION

Any changes or modifications in construction of this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

10. SPECIFICATIONS

Monitor

TV System	EIA or CCIR	Storage temperature range	
Picture tube	Black and White		-25°C to + 85°C (-13°F to + 185°F)
	5.5inch picture measured diagonally	Dimensions	
	90° deflection angle		176(W) - 128(H) - 228(D)mm
Picture image	Factory pre-set to reverse image		7.0(W) - 5.0(H) - 9.0(D)inch
Picture resolution	700TV lines		including projecting parts and controls
Power connector	Red: Positive 12V ~ 24V input	Weight approx.	2.5Kg(5.5 lbs)
	Green: Reverse gear 12V ~ 24V input		including mounting bracket
	Black: Ground	Accessories supplied:	
Inputs	4-pin multi connector	Mounting bracket	1EA
	1) Video input: 1.0V p-p, 75 Ohm, sync negative	Mounting bolts	4EA
	2) Audio	Machine screws	4EA
	3) 12V, 0.2A DC (output)	Rubber washer	4EA
	4) Ground	Tapping screw	4EA
Audio output (S · P)	8 Ohm, 0.5Watt Max.	Nylon nuts	4EA
Audio output (Phone Jack)	10K, 150mV rms	Power cable	16.5 ft (5m)
Video output (Phone Jack)	75 Ohm, 1V p-p	Sunshield	1EA
Power requirements	12V ~ 24V DC	Cable holder	1EA
Power consumption	14W maximum	(Cable reinforcement)	
Operating temperature range		Machine screws M3 × 8	2EA
	-15°C to + 60°C (+5°F to + 140°F)	Rubber Foot	4EA
		Foot Screw WH. M3 × 10	4EA

Camera

PICK-UP DEVICE:		Weight	0.33kg(0.73 lbs)
Image sensor	Interline transfer type CCD	Dimensions	
Picture elements	270,000(EIA) pixels		93(W) × 56(H) × 57.5(D)mm
	290,000(CCIR) pixels		3.7(W) × 2.3(H) × 2.3(D)inch
Picture resolution	430 TV Line	Accessories supplied	
Image size	1/3 inch	Camera bracket	1EA
OPTICAL & OTHER CHARACTERISTICS:		Adhesive vinyl tape	1EA
Lens	Focal length 3.0mm	Machine screws M5 × 15	4EA
	Maximum aperture F=2.0	(with flat, spring washer)	
Synchronization	Internal	Tapping screws \varnothing 5 × 15	4EA
Minimum illumination	0.5 lux	Nylon nuts M5	4EA
Power input	12V DC	Wrench bolt M4 × 8	4EA
Power consumption	2W	(with flat, spring washer)	
Operating temp.	-30°C to + 60°C	Camera calbe	66ft(20m)
	(-22°F to + 140°F)	'L' wrench	1EA