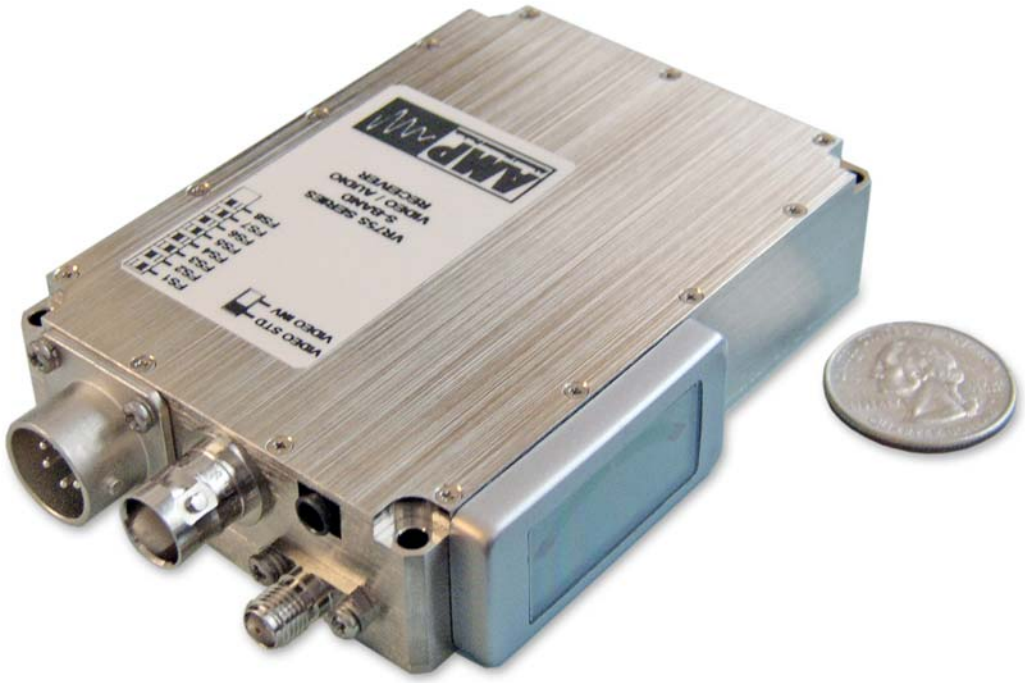
Operation Manual

VR75 Series
UHF, L, S, C-Band
Video / Audio Receivers



Designed and Manufactured By

7025 Longley Lane, Suite 20
Reno, NV 89511

Distributed By

107 Woodbine Down Blvd, Units 7&8
Toronto, ON M9W 6Y1

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1.0 INTRODUCTION

Thank you for choosing this AMP Wireless Video Product. Every effort has been made to design and manufacture a quality product that will meet your surveillance needs for many years. Please visit our website (www.advmw.com/video) for information on other video products and for downloadable datasheets, operation manuals, and frequency selection charts.

If you have any questions regarding this product or if you require technical assistance, please feel free to contact us at the telephone numbers below:

Dyplex Communications	Advanced Microwave Products
(416) 675-2002	(775) 345-9933

1.1 Purpose and Function

VR75 Series Video/Audio Receivers are developed and manufactured by Advanced Microwave Products (AMP) and distributed by Dyplex Communications (Dyplex).

Receivers are designed for color or monochrome video and audio surveillance. Receivers are best operated with AMP's VT15, VT30, and VT50 Series Transmitters but are compatible with most other video transmitters on the market.

1.2 Capabilities

AMP Receivers are designed for harsh environments and feature robust packaging and connectors. Compact package sizes provide versatility in unit placement and system applications.

AMP Receivers require no tuning or adjustments. All units operate directly with any standard video monitor. Power requirements are +9 to +16 Vdc and can be derived from batteries, simple power supplies, or vehicle power.

Whip or "rubber duck" antennas are adequate for many receiver applications. A variety of standard and high performance antennas are available through Dyplex.

AMP Transmitters and Receivers are standard equipped with video inversion, selectable via a slide switch, for a basic level of security.

VR75 Series Receivers are standard equipped for video-only reception. Up to two audio subcarriers may be specified for applications requiring audio reception.

VR75 Series Receivers are available with many options allowing customization to specific applications. Most common options include frequency selection (full band selection), dual L/S-band selection, PAL video, and up to two audio subcarriers.

If our standard products and options do not satisfy your requirements, please contact us. Our experienced design team welcomes your custom specifications.

1.3 Specifications

RF Characteristics

Frequency Range (Specify):	UHF	340.00 - 399.90 MHz	100 kHz Channels
(Other Ranges Available)	L-Band	1710.00 – 1850.00 MHz	250 kHz Channels
	S-Band	2450.00 - 2483.50 MHz	250 kHz Channels
	Dual	1.7-1.85 GHz & 2.2-2.5 GHz	250 kHz Channels
	C-Band	4400.00 – 4999.75 MHz	250 kHz Channels
Frequency Selection (Specify):	Fixed or Channelized, Full Band, Slide Switch Selectable		
Maximum RF Input:	+10 dBm Without Damage		
Input Impedance:	50 _ Nominal, VSWR 1.5:1 Maximum		
Noise Figure:	UHF/L-Band	4.5 dB Maximum	
	S-Band	2.5 dB Maximum	
	Dual	4.8 dB Maximum	
	C-Band	3.5 dB Maximum	
Image Rejection:	UHF/L/S/Dual	60 dB Minimum	
	C-Band	50 dB Minimum	
Signal Strength Output:	0.3 Vdc @ -90 dBm to 5.0 Vdc @ -20 dBm, Monotonic		

LO/IF Characteristics

LO Stability:	±0.002% Over -20°C to +50°C	
IF Frequency:	UHF/S-Band	140 MHz
	L/Dual/C-Band	480 MHz
IF Bandwidth:	18 MHz	
Harmonic and Spurious Level:	-50 dB Maximum	

Video Characteristics

Modulation Type:	Analog FM
Modulation Sense:	Standard (Positive) or Inverted (Negative), Slide Switch Selectable
Frequency Response (Specify):	10 Hz to 3.5 MHz (Monochrome), 4.5 MHz (NTSC), or 5.5 MHz (PAL), ±1.5 dB
Pre-Emphasis (Specify):	525-Line (NTSC), 625-Line (PAL), or None
Output Level:	1 Vpk-pk / ±4 MHz @ Crossover Frequency, into 75 _ Load
Output Impedance:	75 _ Nominal, Unbalanced

Audio Characteristics

Subcarriers (Specify):	None, One, or Two
Subcarrier Frequency (Specify):	4.83, 5.8, 6.0, 6.2, 6.5, 6.8, 7.2, 7.5, 8.3, 8.5, or 8.59 MHz, or Custom
Subcarrier Separation (Two):	700 kHz Minimum
Modulation Type:	Analog FM, Positive Sense
Frequency Response (Specify):	20 Hz to 10 kHz (Audio) or 20 Hz to 100 kHz (Data), ±1.5 dB
De-Emphasis (Specify):	75 µsec (NTSC) or 50 µsec (PAL)
Output Level:	-10 dBV (Line Level) / 100 kHz pk-pk @ 1 kHz Rate, into 600 _ Load
Output Impedance:	600 _ Nominal, Unbalanced

Power Requirements

Input Voltage:	+9 to +16 Vdc, Reverse Polarity Protected	
Current Draw:	UHF/L/S/Dual-Band	275 mA Maximum
	C-Band	300 mA Maximum

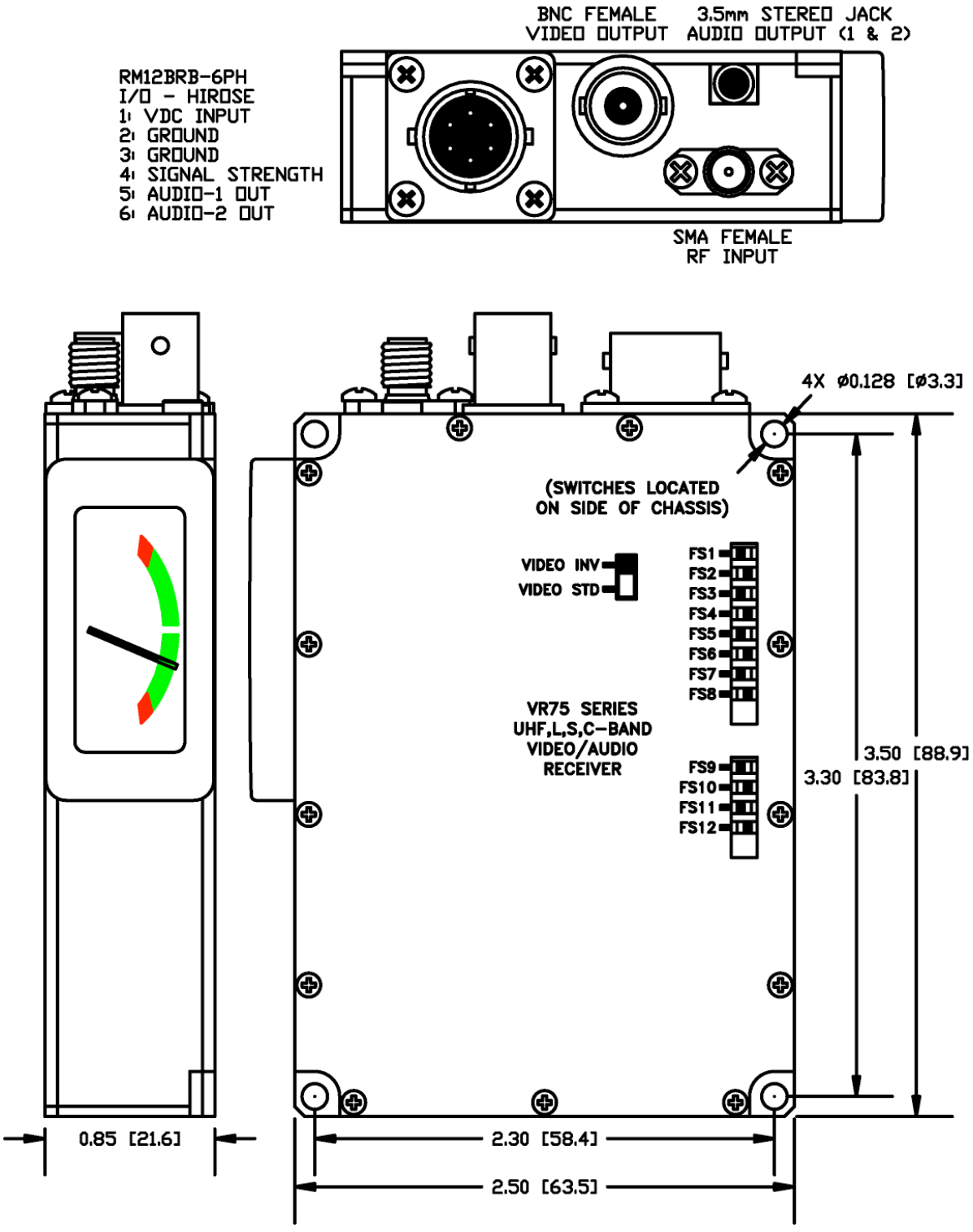
Mechanical

Material:	CNC Machined T6061-T6 Nickel Plated Aluminum		
Dimensions:	2.50” W x 3.50” L x 0.85” H		
Weight:	6 oz. Maximum		
Connectors:	RF Input:	SMA Female	
	Video Output:	BNC Female	
	Audio Output:	3.5mm Stereo Jack	(If Applicable)
	DC Supply, Audio, RSS:	RM12BRB-6PH Hirose Circular	

Environmental

Temperature (Operating):	-20°C to +50°C
Humidity:	Up to 95% @ Any Temperature Forming Frost or Condensation

1.4 Mechanical Drawing and Connector Pin-Outs



1.5 List of Items Furnished

1-Receiver
1-Type RM12BPE-6S Hirose (Socket) I/O Cable

1.6 List of Items Required

Antenna, Type SMA Plug (Male) Connector
Monitor, Type BNC Jack (Female) Connector
Type BNC Plug (Male) to BNC Plug (Male) Video Cable
Video connector adapter to BNC, if monitor does not have BNC connector
Speaker or Headphones (if applicable)
3.5mm Stereo Plug to Dual Mono Adapter (if monitoring dual audio w/ headphones)

1.7 Environmental Requirements

AMP Receivers are designed for indoor or outdoor use. Precautions should be taken when exposing receivers to the elements. Do not expose to 100% humidity.

Receivers should be located in areas where the ambient temperature does not exceed the maximum operating temperature indicated in the specifications (Section 1.4). Placement in confined locations with minimal air flow, in direct sunlight in areas of temperature extremes, or in proximity to other devices which generate heat, such as power supplies, heating systems, etc., should be avoided. Temperatures exceeding +75°C may cause permanent damage to the equipment.

When not used for extended periods of time external connections, including I/O cable, video cable, and antenna, should be removed and the units covered, boxed, or crated and stored in a clean, dry place. See Section 1.7 above for environmental requirements.

2.0 SAFETY PRECAUTIONS

Receivers should be handled with caution like any electrical or electronic device. Do not handle the units or associated cabling with wet hands or materials.

Connections should be made only to previously-tested, active power sources (outlets or batteries) of the correct voltage, and each connector should be inserted only into its designated port. All connections should be checked to ensure they are firmly in place.

3.0 PREPARATION FOR USE

3.1 Unpacking

Carefully remove the receiver from the shipping container and make sure all listed furnished items are included (Section 1.5). Inspect all items for damage. If any item is omitted from the shipment or appears damaged, contact Dyplex or AMP with detailed description of problem.

3.2 Pre-Test

Although each unit is thoroughly tested at the factory for both functional and environmental performance, a minimal amount of pre-testing should be done by the operator before placing the receiver into service. The receiver, an appropriate AMP transmitter, transmit and receive antennas, a video camera, a video monitor, and DC power supplies are the only components required to perform a functional test of the receiver. If testing audio, a microphone and a speaker or headphones will also be required.

The transmit and receive antennas should be situated at a distance of greater than 25 feet apart to prevent serious damage to or destruction of the receiver's front end. Set up the transmitter and make all necessary adjustments in accordance with that unit's Operation Manual. Connect the video camera to the transmitter video input and, if testing audio, connect the microphone to the transmitter audio input.

Verify DC power supplies are between +9 and +16 Vdc. With the I/O Cable (RM12BPE-6S circular connector) DISCONNECTED from the receiver, connect DC power supply to I/O Cable (red = positive DC input, black = negative DC input (ground)). Do not connect I/O Cable to receiver until all other connections are complete.

Connect the receive antenna to receiver RF input connector (SMA). Connect the Video Cable between the receiver video output connector (BNC) and the video monitor. If testing audio, connect the speaker to the I/O Cable or headphones to the 3.5mm Audio Jack. Refer to Section 4.1 for I/O Cable wiring.

Configure switches as instructed in Section 4.2. Connect I/O Cable to receiver (mates to RM12BRB-6PH circular connector on receiver). Video should be observed on the monitor and audio heard through the speaker / headphones (if applicable).

If no video or audio (if applicable) is present, refer to Section 5.2 for troubleshooting instructions.

4.0 INSTALLATION AND OPERATING INSTRUCTIONS

4.1 Use and Function of Connectors

AMP Receivers are simple to install, requiring only connection to the antenna, monitor, speaker or headphones (if applicable), and DC power supply using the appropriate cables and jacks. The use and function of the receiver connectors are as follows:

I/O CONNECTOR (RM12BRB-6PH) *Mate: Supplied RM12BPE-6S I/O Cable*	Red Wire – Positive DC Input *(+9 to +16 Vdc)* Black Wire – Negative DC Input *(Ground)* Brown Wire – Ground *(for speakers)* White Wire – Received Signal Strength Out Yellow Wire – Audio 1 Output *(if applicable)* Violet Wire – Audio 2 Output *(if applicable)*
AUDIO CONNECTOR (3.5mm Jack) *Installed only when subcarrier(s) specified* *Mates: One subcarrier – 3.5mm Mono Plug* *Two subcarriers – 3.5mm Stereo Plug or Stereo Plug to Dual Mono Jack Adapter*	Mono Prong – Audio 1 Output *(if applicable)* Stereo Prong – Audio 2 Output *(if applicable)* Ground – Ground / Shield
VIDEO CONNECTOR (BNC) *Mate: Supplied Video Cable*	Standard 75 Ohm Video Output *Outputs Standard 1 Vpk-pk Video Signal*
RF INPUT CONNECTOR (SMA) *Mate: Appropriately Selected SMA Antenna*	Standard 50 Ohm RF Input

4.2 Use and Function of Switches

4.2.1 Frequency Selection Switches:

Frequency selectability is an option on all VR75 Series Receivers providing RF frequency control with rocker switches accessible on the side of the chassis. S-Band units utilize 8 rocker switches; UHF, L-Band, and C-Band units utilize 12 rocker switches. Each switch is uniquely identified (FS1 through FS8, or FS1 through FS12) on the unit label.

To program the desired RF frequency, position the individual switches as shown in the applicable Frequency Selection Chart, included with product shipment and available as a download on the applicable Video Product Page of our website (www.advmw.com/video).

4.2.2 Video Inversion Switch:

All AMP Transmitters and Receivers are standard equipped with video inversion, selectable with a slide switch. When selected, the phase of the video signal is inverted (shifted 180^{o}) in the transmitter and re-inverted in the receiver, providing a basic level of security. If an inverted video signal is detected by a receiver not configured for inversion, the resulting picture is scrambled.

To select standard video (no inversion), position the slide switch to VIDEO STD as indicated on the unit label. To select inverted video (phase inversion), position the slide switch to VIDEO INV as indicated on the unit label.

The video inversion switch position on AMP's Receivers must match that of the transmitter or the picture will appear scrambled. If using AMP's Receivers with other receivers or vice-versa, position the Video Inversion slide switch to VIDEO STD.

4.3 Audio Output(s):

VR75 Receivers, when equipped for subcarriers, offer dual buffered audio outputs for each subcarrier. Up to two subcarriers may be specified.

When one subcarrier is specified, the audio output signal is available on pin 5 (yellow wire) of the I/O Connector and the mono prong of the 3.5mm Jack. The outputs are buffered providing one audio output for monitoring (3.5mm Jack) and one for recording (I/O connector). Both outputs are 600 Ohms, unbalanced, at line level (-10 dBV).

When two subcarriers are specified, the audio output signals are available on pins 5 (audio 1, yellow wire) and 6 (audio 2, violet wire) of the I/O Connector and the mono (audio 1) and stereo (audio 2) prongs of the 3.5mm Jack. A 3.5mm Stereo Plug to Dual Mono Jack Adapter may be used to separate the audio signals into two 3.5mm mono ports. All four audio outputs are buffered providing simultaneous monitoring and recording of all outputs. All outputs are 600 Ohms, unbalanced, at line level (-10 dBV).

4.4 Signal Strength Meter:

VR75 Receivers are standard equipped with a Signal Strength Meter mounted to the chassis. Received signal strength is indicated by a bar apparent on the meter when the receiver is powered. This meter is intended to roughly indicate received signal strength and reads similar to an analog fuel gauge. That is, when the bar is towards the left, signal strength is low (far left ≈ -90 dBm). When the bar is towards the right, signal strength is high (far right ≈ -20 dBm).

If the meter exhibits a display full of flashing bars, signal strength is excessive and damage to the receiver front end may occur. **Do not rely on flashing bars to indicate levels that may cause receiver damage.** Damage may occur at lower levels, thereby preventing flashing bars from occurring.

4.5 Initial Adjustments and Settings

There are no initial adjustments or settings necessary to use AMP Receivers other than proper configuration of the switches as outlined above in Section 4.2. To assure optimum performance, the user should be familiar with the camera, monitor, microphone, and speaker/headphones used with this video/audio system.

4.6 Shut Down

If the receiver is to be shut down only briefly, simply remove DC voltage from the I/O Cable or disconnect I/O Cable from receiver. If the unit is to be shut down for an extended period, all external cabling including the antenna should be removed and the unit should be stored in a container and placed in a clean, dry environment.

5.0 MAINTENANCE INSTRUCTIONS

5.1 Cleaning

AMP Receivers should be periodically wiped off with a clean, damp cloth. For more thorough cleaning, dampen a clean cloth with glass cleaner and wipe off unit. Ensure units are completely disconnected from their power sources before cleaning.

5.2 Troubleshooting

To avoid poor performance, ensure all receiver and mating connectors are tightly fastened, clean, and have no pins bent or damaged.

Verify configuration of all switches (refer to Section 4.2).

If poor or no operation is observed, ensure the external DC voltage supply is between +9 and +16 Vdc with correct polarity. All AMP Receivers have over-voltage and reverse polarity protection circuits. If the input voltage is over +16 Vdc, remove the I/O Cable from the receiver, reduce the DC voltage to between +9 and +16 Vdc, and reconnect the I/O Cable. If the input voltage is negative polarity, remove the I/O Cable from the receiver, reverse the connections between the DC voltage supply and I/O Cable, and reconnect the I/O Cable.

If all connections are adequate, switches are correctly configured, and DC voltage is correctly applied, check the video monitor, video cable, and antenna for damage. A camera may be connected directly to the monitor to verify proper monitor operation.

For audio applications, if receiving video but no audio, check connections between I/O Cable and speaker(s) or 3.5mm Jack and headphones (whichever used). Also check speakers/headphones and I/O cable for damage.

If these efforts fail, **do not attempt to repair the unit.** Please contact Dyplex or AMP with a detailed description of the problem. Depending on the nature of the problem, Dyplex or AMP may provide further troubleshooting assistance or advise the entire system be returned for repair and retest.

Caution: Removal of the cover constitutes breaking the seal and VOIDS PRODUCT WARRANTY.

5.3 Preparation for Reshipment

If the receiver and/or any other purchased item(s) are to be shipped to another location or returned for repair or realignment, use the original packaging or a sturdy box with sufficient protective material to avoid damage from movement or exposure during transit. Remove all external connections (cables, antenna, etc.) prior to shipping.

5.4 Returning an Item

Please contact Dyplex customer service at (416) 675-2002 for a Return Authorization Number before returning an item. The Dyplex ship-to address is listed below. When returning an item, always include a contact name and phone number and a detailed description of the problem with your shipment.

Dyplex Communications
107 Woodbine Downs Blvd, Units 7 & 8
Etobicoke, Ontario,
Canada M9W 6Y1

WARRANTY STATEMENT

Advanced Microwave Products (AMP) warrants these products to be free from defects in material and workmanship for a period of one year from date of original shipment. AMP shall, at its option, either repair or replace products which prove to be defective.

No products may be returned to AMP without the permission of AMP. BUYER, after obtaining a return authorization from AMP, shall return the equipment to AMP accompanied by a report stating as completely as possible the reason for return, the defects, and the conditions under which they occurred. BUYER shall pay all shipping charges, duties, and fees for the return of products to AMP. All warranty services will be carried out at AMP's facility. AMP will pay for the return of products to the BUYER.

All articles are to be properly and carefully inspected by BUYER upon receipt. Shipping container damage may indicate equipment damage. All shipping damage must be promptly reported to the carrier. AMP is not liable for shipping damage.

Limitation of Warranty: The above warranty does not apply to defects of, or resulting from the following:

1) End items included as part of a system, but not designed by, AMP are subject only to warranty as may be obtained from the original manufacturers. Such items include, but are not limited to, batteries, cameras, monitors, cabling, etc.,

2) Operation outside of the environmental specifications of the product,

3) Unauthorized modifications, misuse, or mishandling,

4) Improper or inadequate maintenance by BUYER,

5) Improper or inadequate heat sinking by BUYER

6) Improper installation or improper testing,

7) Malfunction of connected hardware.

THIS WARRANTY IS EXCLUSIVE AND NO OTHER WARRANTY, WHETHER WRITTEN OR ORAL, IS EXPRESSED OR IMPLIED. AMP SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The remedies set forth above are the purchaser's sole and exclusive remedies. In no circumstances shall AMP assume liability for loss, damage, or consequential expense (including loss of profits) whether based on contract, tort, or any other legal theory, arising directly or indirectly from the use of its equipment separately or in combination with other equipment.