Understanding & Eliminating 50Hz & 60Hz Hum

RF transmission in cables is routinely plagued by 50Hz or 60Hz hum or other interference. When a cable is used for video signals, small electrical currents caused by differences in ground potential (ground loops) or induced common-mode moise, can result in considerable hum interference. Cameras, video recorders, monitors and video effects generators... even switchers and computers downstream ... are affected.

Allen Avionics manufactures three types of products to eliminate hum caused by ground loops or induced currents. All are broadcast quality, although they can be inserted anywhere in the transmission system, they are most effective at or near the end of the cable run.

Hum Eliminators Model HEC

. . . **work best** in those circumstances where interference is caused by small differences in ground potential (less than 20 volts) or by induced currents in long cable runs.

When there are multiple power panels in a building, or on a single floor, equipment and lighting loads result in small differences in potentiaal which induce ground loop current flow and 60 Hz. Hum.

Electromagnetically-induced currents in long cable runs also create hum. For 50Hz and 60Hz power systems, and where induced currents are high, the HEC-2000 and HEC-2000H increase the attenuation at power frequency.

Video Noise Eliminators Model VNE

. . . are effective for video signals up to 30MHz - encompassing HDTV frequencies - with little distortion. For dignals belwo 20 MHz, they are totally transparent.

Since hum reduction, using VNEs, is not as great as with HECs, their use is recommended only where higher frequencies are involved.

Hum vs. Noise … What's the Difference?

Simply stated, for video application - there is none. Hum eliminators and video noise eliminators only remove unwanted 50Hz or 60Hz signals from video cables.

Video Isolation Transformers Model VIT

Breaking the ground connection in video transmission lines will eliminate 60 Hz hum caused by ground loops. When there are hum problems caused by large potential differences (20 volts or more), the VIT product is the one to use.

The dielectric withstanding voltage of the VIT is over 500 volts at DC. VIT's are true isolation transformers - there is no DC path between the windings.

Frequency response is flat over the range 20Hz to 4.5MHz. VITs also remove the hum created by electromagnetically induced currents from power lines or distribution systems.

Note: Provisions must be made for DC control signals - such as camera controls - which VITs will block

Allen Avionics - Division of Star Hydraulics River Grove, IL. 60171 PH:708-453-3238

Hum Eliminators

	HUM ELIMINATOR MODELS				
	HEC-500	**HEC-1000**	**HEC-2000 HEC-2000-H HEC-2000-V**	**HEC-3000**	**HEC-4000**
IMPEDANCE	50 Unbalanced	75 Unbalanced	75 Unbalanced	75 Unbalanced	75 GBR Unbalanced Sync Balanced
BANDWIDTH	DC to 30MHz 0.61dB @ 10MHz 1.00dB @ 20MHz 1.25dB @ 30MHz		DC to 30MHz 0.75dB @ 10MHz 1.20dB @ 20MHz 1.50dB @ 30MHz	DC to 30MHz 0.75dB @ 10MHz 1.20dB @ 20MHz 1.50dB @ 30MHz	GBR: DC to 30MHz Sync: 20Hz to 6MHz 0.75dB @ 10MHz 1.00dB @ 20MHz 1.25dB @ 30MHz
HUM REDUCTION	50dB for 60Hz.hum depending on system		60dB for 50Hz or 60Hz.hum depending on system	60dB for 50Hz or 60Hz.hum depending on system	60dB for 50Hz or 60Hz.hum when used in GBR or YUV system
PACKAGE	Hi-Impact ABS Plastic		Die Cast Metal	Die Cast Metal	Die Cast Metal
MOUNTING	Four (4) 8-32 x 1/2" Inserts		Four (4) 6-32 x 1/2" Inserts	Four (4) 6-32 x 1/2" Inserts	Four (4) 6-32 x 1/2" Inserts
DIMENSIONS ht x width x depth	5-3/8" x 4" x 2"		4-11/16" x 3-11/16" x 2-1/16"	4-11/16" x 3-11/16" x 2-1/16"	7-7/16" x 4-3/4" x 3-1/16"
WEIGHT	3 Lbs.		3 1/2 Lbs.	3 1/2 Lbs.	6 Lbs.
INSERTION LOSS	0.2 dB max.		0.2 dB max.	0.2 dB max.	0.2 dB max.
RETURN LOSS	20 dB min.		20 dB min.	20 dB min.	20 dB min.
ISOLATION BETWEEN CHANNELS (Typical)	N/A		N/A	70 dB	80 dB

Video Hum and Noise Eliminators

	VIDEO NOISE ELIMINATORS			VIDEO ISOLATION TRANSFORMERS		
	VNE-50	**VNE-75**	**VNE75-3**	**VIT-50**	**VIT-75**	**VIT 75-3**
IMPEDANCE	50 Unbalanced	75 Unbalanced	75 Unbalanced	50 Unbalanced	75 Unbalanced	75 Unbalanced
BANDWIDTH	DC to 30MHz 0.8dB @ 20MHz 1.0dB @ 30MHz		DC to 30MHz 0.8dB @ 20MHz 1.0dB @ 30MHz	Video Bandwidth 20Hz to 6MHz		Video Bandwidth 20Hz to 6MHz
HUM REDUCTION	40dB for 60Hz.hum depending on system		40dB minimum per channel	Video Isolation; 100 Megohms min.		Video Isolation; 100 Megohms min.
PACKAGE	Hi-Impact ABS Plastic		Die Cast Metal	Hi-Impact ABS Plastic		Die Cast Metal
MOUNTING	Four (4) 8-32 x 1/2" Inserts		Four (4) 6-32 x 1/2" Inserts	Four (4) 8-32 x 1/2" Inserts		Four (4) 6-32 x 1/2" Inserts
DIMENSIONS ht x width x depth	4-3/8" x 3-1/4" x 2"		7-7/16" x 4-3/4" x 2-1/16"	3-3/4" x 2-5/8" x 1-1/2"		4-11/16" x 3-11/16" x 2-1/16"
WEIGHT	1 1/2 Lbs.		3 Lbs.	1 Lb.		2 1/2 Lbs.
INSERTION LOSS	0.2 dB max.		0.2 dB max.	0.1 dB max.		0.1 dB max.
RETURN LOSS	20 dB min.		20 dB min.	20 dB min.		20 dB min.
ISOLATION BETWEEN CHANNELS (Typical)	N/A		70 dB	N/A		60 dB