VEA-7007
Video/AES Equalizing Amp
User Manual

7007-VEA-01-MNL
Issue: 1

VEA-7007 • Video/AES Equalizing Amp – User Manual

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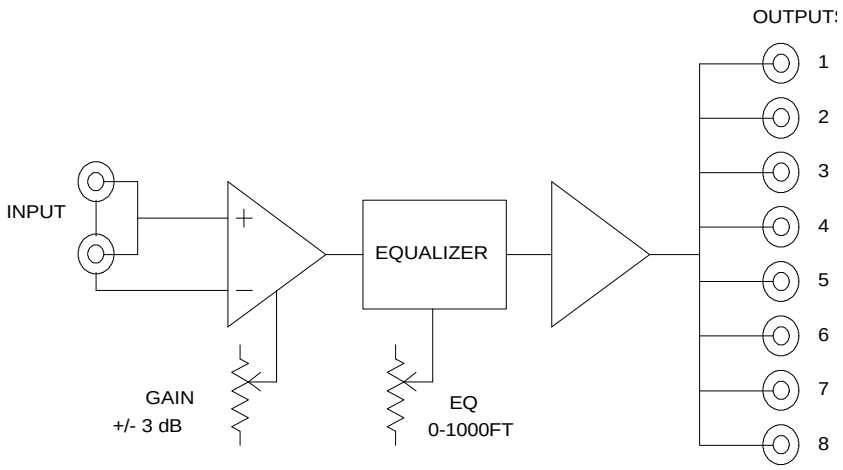


Introduction

The VEA-7007 provides remarkable value and excellent performance in a basic equalizing amplifier for video and AES audio.

The VEA-7007 is an economical equalizing amplifier well suited to analog video or AES audio distribution where the source signal is of good quality and does not require clamping correction.

The amplifier has eight outputs and provides cable equalization for up to 1000 ft. (305m) of 8281 cable. Versions are available for other popular cable types.

It superbly eliminates normal distribution problems such as cable high-frequency loss and ground loop hum. Because the amplifier is D.C. coupled, clamping is not required, thus minimizing signal distortion. This enables it to deliver eight precision copies of the original signal, whether video or AES audio.

Precise factory calibration and one-control equalization eliminates the need for sweep testing and simplifies installation.

Features

- Video or AES audio distribution
- Economical Cost
- Cable equalization to 1000 ft. (305m)
- Versions available for several cable types
- DC-Coupled for minimum distortion
- Excellent ground loop hum rejection
- Very stable over a wide temperature range
- Rugged construction
- Cards are individually fused
- 5 year transferable warranty
- Fits into a Ross or Leitch* DA frame
- An alternative to Leitch* VEA-683 amplifier

* Leitch is a Trademark of Leitch Technology Corporation

Operation

The only user-operated controls are GAIN and EQUALIZATION. These are set as required for the situation and cable length. Use any suitable test signal, which would enable the signal gain and subcarrier level to be correctly set. (e.g. pulse & bar or color bar). A sweep signal can be used, but is not normally necessary.

Circuit Description

Input amplifier U2 has a differential input with excellent common-mode rejection. The output from U2 is an inverted signal, which feeds gain control RV1.

Buffer amplifier U1 drives the negative input of the output stage U3 which causes the signal to again invert to provide normal polarity output. It also drives the equalization control RV2. RV2 is normally adjusted to precisely compensate for the cable loss, as viewed at the amplifier output.

The signal from RV2 passes to the base of common-emitter amplifier Q2. A complex network connected to the emitter of Q2 causes amplification to occur in accordance with the coax cable loss characteristic, that is, the gain increases rapidly with increasing frequency. The amplified equalization signal appears at the collector of Q2 and is fed to the positive input of the output stage U3 which adds it to the original signal to complete the equalization process. Q1 provides a constant-current source for Q2 D.C. current.

Power regulation and filtering is provided by U8, U5, U4, and U6.

Alignment

IMPORTANT:

All Ross distribution amplifiers have been very accurately calibrated at the factory. Alignment should only be attempted if absolutely necessary and the required precision sweep measuring equipment is available.

1. TEST SETUP

   Put the amplifier on the extender board and turn power on.

2. POWER REGULATORS

   Use a voltmeter to test for the presence of regulated +5 volts at TP2 and TP3, and -5 volts at TP4 and TP5.

3. GAIN CALIBRATION

   Set up a method of accurately measuring amplifier gain, using a window or pulse & bar signal. Turn the equalization control RV2 fully counter-clockwise until completely at minimum. Adjust the gain control (RV1) to obtain unity gain.

4. FREQUENCY RESPONSE - 0 ft

   Adjust CV1 and RV3 for flattest response to 14 MHz.

5. EQUALIZER CALIBRATION - 1000 ft

   Connect 1,000 ft of 8281 or equivalent cable in series with the sweep signal to the amplifier. Adjust CV2 and RV2 for flattest response to 12 MHz.

Specifications

Input

Video Input Level	1 V pp
Input Impedance	75 bridging
Input Return loss	46 dB to 5 MHz
Max common mode signal	4 V pp
Common mode rejection	60 dB at 60 Hz

Output

Number of outputs	8
Output impedance	75
Output return loss	46 dB to 5 MHz
Output isolation	45 dB to 5 MHz
D.C. Offset	< 20 mV
Output loading per termination at 10 Mhz	0.01 dB

Equalization

Response accuracy 0 to 1000 feet	+/- 0.04 dB to 8 MHz

Coupling

Normal	DC Coupled

Performance

Gain range	+ 3 dB to -3 dB
Gain stability	< 0.1% per 10 degrees C
Frequency response typically	+/-0.02 dB to 10 MHz
	-1.0 dB @ 20 MHz
Bandwidth	-3 dB @ 36 MHz
Line rate window tilt	< 0.2%
Field rate window tilt	< 0.2%
50/60 Hz square wave tilt	< 0.1%
Bounce (black to white)	< 0.5%
Differential gain (10%-90% APL)	< 0.1%
Differential phase (10%-90% APL) all outputs loaded	< 0.1 degrees
RMS noise 0-5 MHz (unweighted)	68 dB
Chrominance/luminance delay	< 2.0 ns
K rating 1 T	0.3%

Other

5-Year Transferable Warranty

Specifications and design are subject to change without notice.

Ordering Information

VEA-7007	Video Equalizing Amplifier (8281 cable)
VEA-7007-59	Video Equalizing Amplifier (RG-59 & 8241)
VEA-7007-1505	Video Equalizing Amplifier (1505 & VPM-2000)
VFR-7210	Video DA Mounting Frame 2RU, holds 10modules
VFR-7214	Video DA Mounting Frame 1RU, holds 4 modules
PS-7103	Universal Power Supply 85-250V
EXT-7200	Extender Board

Note: All Ross Video Limited terminal equipment frames include one power supply. A redundant power supply may be installed in all two-rack unit frames if required. One Owner's manual is supplied with each frame.

The Ross video frame will accept any Leitch† compatible card.

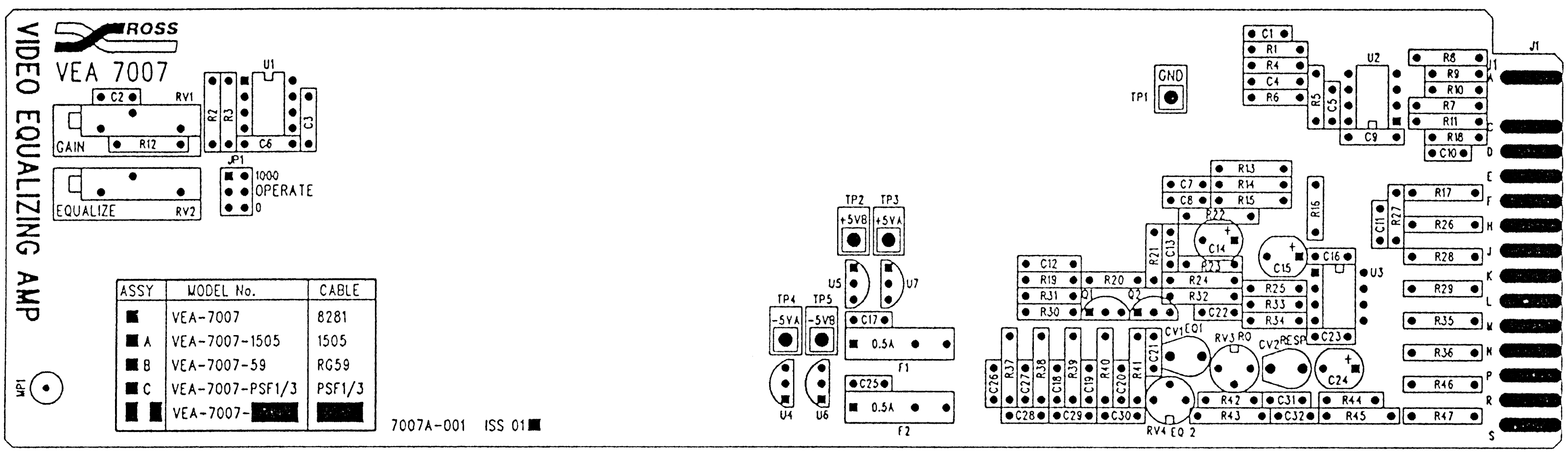
†Leitch is a trademark of Leitch Technology Corporation

VEA-7007 VIDEO EQUALIZING AMP. Revised: August 5, 1998
7007A-001 Revision: 01
Bill Of Materials August 5, 1998 18:21:12 Page 1

Item	Quantity	Reference	Part	DESCRIPTION		PART NUMBER
1	1	J1	CON\30P\156\E	NOT A BOUGHT PART		-------
2	5	C1,C10,C28,C30,C31	NVC	NO VALUE,CAP,DCAP\SR21	THL	-
3	2	C15,C24	NVC CAP\MA22	NO VALUE,CAP,CAP\MA22	THL	
4	2	R1,R18	NVR	NO VALUE,RES,5%	THL	-------
5	1	R41	NVR 1%	NO VALUE,RES,1%	THL	-------
6	5	TP1,TP2,TP3,TP4,TP5	NVTP	NO VALUE,TEST POINT	THL	-------
7	1	C13	2P2	CAP,CER,100V,0.25PF,2p2	THL	200-220
8	1	C5	5p6	CAP,CER,100V,0.25PF,5p6	THL	200-560
9	1	C8	6p8	CAP,CER,100V,0.25PF,6p8	THL	200-680
10	1	C21	8p2	CAP,CER,100V,0.25PF,8p2	THL	200-820
11	1	C29	10p	CAP,CER,100V,2%,10p	THL	201-100
12	2	C27,C2	12P	CAP,CER,100V,2%,12p	THL	201-120
13	1	C7	15p	CAP,CER,100V,2%,15p	THL	201-150
14	1	C18	39p	CAP,CER,100V,2%,39p	THL	201-390
15	1	C26	47p	CAP,CER,100V,2%,47p	THL	201-470
16	1	C20	56p	CAP,CER,100V,2%,56p	THL	201-560
17	1	C19	n10	CAP,CER,100V,2%,n10	THL	202-100
18	1	C11	n68	CAP,CER,n68	THL	202-680
19	1	C32	2n2	CAP,CER,2n2	THL	203-220
20	5	C16,C17,C22,C23,C25	1u 206-100	CAP,CER,50V,20%,1u0	THL	206-100
21	5	C3,C4,C6,C9,C12	100n	CAP,GLAS,100n	THL	225-100
22	1	C14	22u 250-011	CAP,ALUM,16V,22u	THL	250-011
23	2	CV1,CV2	2p8-10p	CAP,TRIM,2p8-10p	THL	270-006
24	1	MP1	365-001	EJECTOR,PCB	THL	365-001
25	2	F1,F2	500mA 3P	FUSE,500mA,125V,FAST ACTING,SUBMIN	THL	390-018
26	1	JP1	403-004-06	HDR,6P,2 ROW,PL.23,BL.1,LL.1,M	THL	403-004-06
27	2	U5,U7	LM78L05	REGULATOR,POS,VOLTAGE	THL	500-024
28	2	U6,U4	LM79L05	REGULATOR,NEG,VOLTAGE	THL	500-025
29	1	U1	AD810AN	AMP,VIDEO,100MHz,TEMP/STAB	THL	504-100
30	1	U2	EL4430CN	AMP,VIDEO,INSTRUMENTATION	THL	504-232
31	1	U3	AD8010AN	AMP,HI SPEED,160mA O/P CURRENT	THL	504-345
32	1	JPPLUG1	603-005	JUMPER,2-POS,LOW PROFILE		603-005
33	1	PCB1	7007-001-01	VIDEO EQUALIZING AMP ----------	PCB	7007-001-01
34	2	RV4,RV3	1K 1T	TRIMPOT,1/4 DIA,1T,1K	THL	710-005
35	2	RV2,RV1	200R 720-007	TRIMPOT,20T,200R	THL	720-007
36	1	R7	37R4 1%	RES,1/4W,1%,37R4	THL	811-374
37	1	R12	174R 1%	RES,1/4W,1%,174R	THL	812-174
38	1	R43	200R 1%	RES,1/4W,1%,200R	THL	812-200
39	1	R45	402R 1%	RES,1/4W,1%,402R	THL	812-402
40	1	R32	470R 1%	RES,1/4W,1%,470R	THL	812-470
41	1	R3	750R 1%	RES,1/4W,1%,750R	THL	812-750
42	1	R24	1K 1%	RES,1/4W,1%,1K	THL	813-100
43	1	R38	1K58 1%	RES,1/4W,1%,1K58	THL	813-158
44	1	R22	2K61 1%	RES,1/4W,1%,2K61	THL	813-261
45	1	R13	3K92 1%	RES,1/4W,1%,3K92	THL	813-392
46	1	R40	4K22 1%	RES,1/4W,1%,4K22	THL	813-422
47	1	R14	4K64 1%	RES,1/4W,1%,4K64	THL	813-464
48	1	R15	4K99 1%	RES,1/4W,1%,4K99	THL	813-499
49	1	R2	5K62 1%	RES,1/4W,1%,5K62	THL	813-562
50	1	R39	8K25 1%	RES,1/4W,1%,8K25	THL	813-825
51	2	R11,R8	22K1 1%	RES,1/4W,1%,22K1	THL	814-221
52	1	R37	158K 1%	RES,1/4W,1%,158K	THL	815-158
53	2	R16,R34	1R	RES,1/2W,5%,1R	THL	824-100
54	2	R27,R6	15R	RES,1/2W,5%,15R	THL	825-150
55	3	R23,R25,R33	150R	RES,1/2W,5%,150R	THL	826-150
56	1	R30	270R	RES,1/2W,5%,270R	THL	826-270
57	4	R9,R10,R20,R21	330R	RES,1/2W,5%,330R	THL	826-330
58	1	R5	390R	RES,1/2W,5%,390R	THL	826-390
59	1	R31	680R	RES,1/2W,5%,680R	THL	826-680
60	1	R42	820R	RES,1/2W,5%,820R	THL	826-820
61	2	R4,R19	1K	RES,1/2W,5%,1K	THL	827-100
62	1	R44	82K	RES,1/2W,5%,82K	THL	828-820
63	8	R17,R26,R28,R29,R35,R36, R46,R47	75R 0.5%	RES,1/4W,0.5%,75R	THL	840-004
64	2	Q2,Q1	2N3904	TRANSISTOR,N-P-N	THL	950-016

SQUARE PIN DESIGNATIONS:
- INTEGRATED CIRCUIT = PIN 1
- TRANSISTOR = EMITTER
- DIODE = CATHODE (BAR)
- POLARIZED CAPACITOR = POSITIVE PIN (+)
- RESISTOR NETWORK = PIN 1

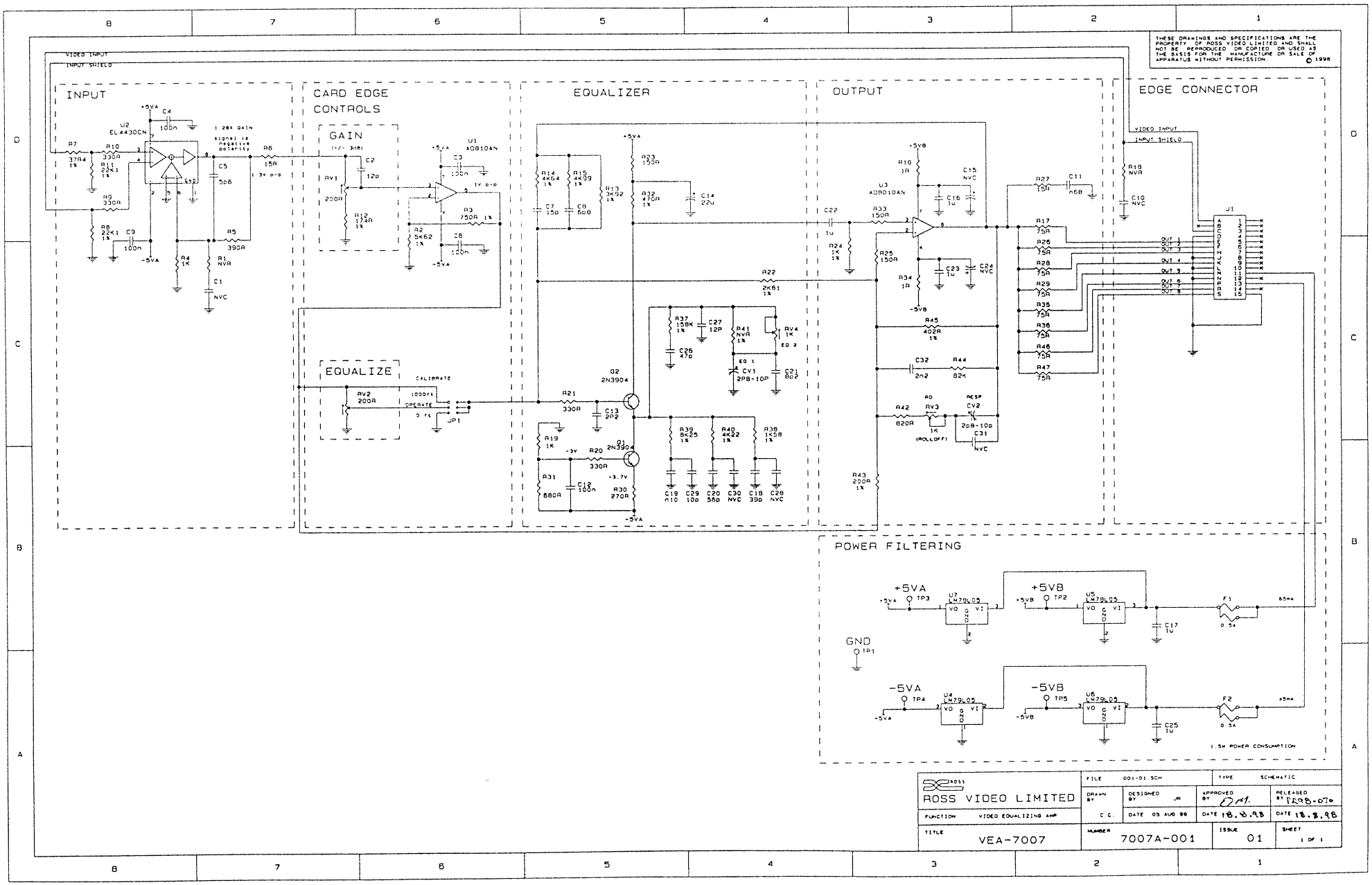
NV = NO VALUE COMPONENT (INSTALLED BY TEST)
LED = POSITIVE PIN (LONG LEG)



ASSY	MODEL No.	CABLE
■	VEA-7007	8281
■ A	VEA-7007-1505	1505
■ B	VEA-7007-59	RG59
■ C	VEA-7007-PSF1/3	PSF1/3
■	VEA-7007-[redacted]	[redacted]

RV1 = GAIN
RV2 = EQUALIZE
RV3 = ROLL OFF
RV4 = EQUALIZATION 2
CV1 = EQUALIZATION 1
CV2 = RESPONSE
JP1 = 1000
OPERATE
0

ROSS VIDEO LIMITED	FILE LA7007-1.001		TYPE LAYOUT	
FUNCTION VIDEO EQUALIZING AMP	DRAWN BY GED	DESIGNED BY J.R. DATE 25 FEB 95	APPROVED BY [illegible] DATE [illegible]	RELEASED BY [illegible] DATE 18.8.98
TITLE VEA-7007	NUMBER 7007A-001		ISSUE 01	SHEET 1 of 1



ROSS VIDEO LIMITED	FILE 001-01.SCH		TYPE SCHEMATIC
	DRAWN BY C.C.	DESIGNED BY JR DATE 05 AUG 98	APPROVED BY DM. DATE 18.8.98	RELEASED BY TA98-07 DATE 18.8.98
FUNCTION VIDEO EQUALIZING AMP				
TITLE VEA-7007	NUMBER 7007A-001		ISSUE 01	SHEET 1 OF 1

RossGear Terminal Equipment • Warranty and Repair Policy

This **RossGear Terminal Equipment** product is warranted to be free of any defect with respect to performance, quality, reliability and workmanship for a period of FIVE (5) years from the date of shipment from our factory.

In the event that your **RossGear** product proves to be defective in any way during this warranty period, we will gladly repair or replace this piece of equipment with a unit of equal or superior performance characteristics.

Should you find that this **RossGear** product has failed after your warranty period has expired, we will repair your defective piece of equipment for as long as suitable replacement components are available. You, the owner, will bear any labor and/or component costs incurred in the repair or refurbishment of said equipment, beyond the **FIVE (5)** year warranty period.

Should your **RossGear** product be of our **Digital Terminal Equipment** product line, a power supply, or product with surface mount devices, and it proves to be defective, we would ask that an authorized **Ross Video Limited** factory representative repair the product. Any attempt to repair this product by anyone other than an authorized **Ross Video Limited** factory representative, will void your warranty.

If this is a manual for a **RossGear** product of our **Digital Terminal Equipment** product line, a power supply, or piece of equipment that carries surface mount devices, you will find it provides all pertinent information for the safe installation and operation of your **RossGear** product.

If this is a manual for a **RossGear** product from our **Analog Terminal Equipment** product line, you will find it provides all pertinent information for the safe installation and operation of your **RossGear** product. Included in this manual (if this product does not carry any surface mount devices) you will also find schematics, bills of materials and layout drawings. These are provided for your convenience, should you find it necessary to perform discretionary field repair or modifications to your **RossGear** product.

Ross Video Limited reserves the right to assess any modifications or repairs made by you and decide whether they fall within warranty limitations, should you decide to return your **RossGear** product for repair.

In no event shall **Ross Video Limited** be liable for direct, indirect, special, incidental, or consequential damages (including loss of profits) incurred by the use of this product. Implied warranties are expressly limited to the duration of this warranty.

IN CASE OF PROBLEMS:

Should any problem arise with your **RossGear Terminal Equipment Product**, please contact our **Customer Service Department** at **613-652-4886**, 24 hours a day, 7 days a week.

A Return Material Authorization number (RMA) will be issued to you, as well as specific shipping instructions, should you wish our factory to repair your **RossGear** product. A temporary replacement, if required, will be made available for a nominal charge. Any shipping costs incurred, will be the responsibility of you, the customer. All products shipped to you from **Ross Video Limited**, will be shipped collect.

RossGear Terminal Equipment product advice is available, without charge, for the life of this equipment.