

VT2400SC2D

1.5W

VIDEO TRANSMITTER MODULE

F.C.C. I.D. NVRVT2400SC2D

END-USER INSTRUCTION MANUAL

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1. INTRODUCTION

Thank you for your purchase of the LMW Model VT2400SC2D 1.5W Video Transmitter Module. The VT2400SC2D is part of a series of innovative low power Video Transmitters that include the VT24SC2D, VT240SC2D and VT2450SC2D Video Transmitters. These small 12V DC Video Transmitter modules can be used for various applications in custom Wireless Video Transmission systems, including Wireless Video Surveillance Systems. These modules are the same as those embedded within the LMW Electronics Ltd., series of Wireless Video Surveillance systems available as turnkey, fully duplex, remote video monitoring equipment.

Practical applications for these Video Transmitters range beyond the law enforcement and security communities. They have been employed by the military, in research, by industry, and in a variety of recreational applications both mobile and fixed. LMW Electronics Ltd., of Leicester, England has been the leader in the design and manufacture of rugged and reliable Wireless Video systems for over ten years. LMW Wireless Video Products are guaranteed for one year and are a proven reputation within the Wireless Video world.

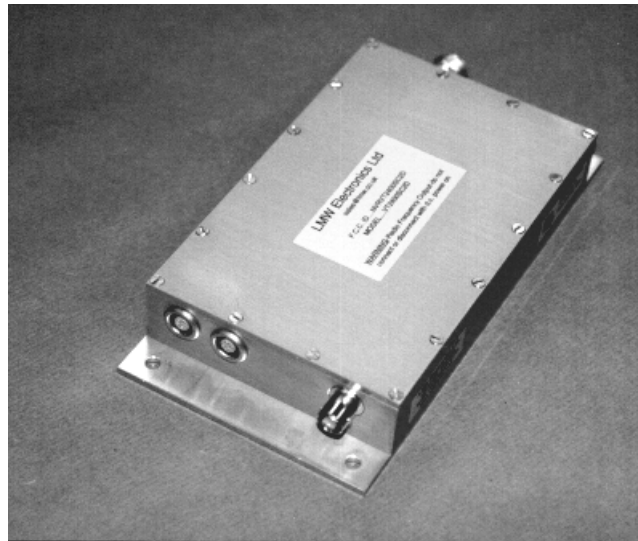
The End-User Instruction Manual is part of a two manual set that accompanies your VT2400SC2D and provides service details, alignment instruction, schematic drawings and parts listing for this transmitter. Additional service assistance for the VT series of LMW Video Transmitters can be obtained from the closest LMW Electronics Ltd., U.S. Distributor/Representative included on page??? of this manual

<p>WARNING: THE SEMICONDUCTORS IN THIS MODULE MAY CONTAIN TOXIC BERYLLIUM OXIDE AND THEREFORE MUST BE HANDLED WITH EXTREME CAUTION. DISPOSAL OF THESE SEMICONDUCTORS MUST BE VIA A SPECIALIST DISPOSAL COMPANY.</p>
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2. VT2400SC2D MULTI-CHANNEL HIGH POWER VIDEO TRANSMITTER

The VT2400SC2D is an S-band (nominally 2.4GHz) video transmitter with nominal 1.5 Watt output, having two audio subcarriers, which will support full colour video applications. The transmitted bandwidth is minimised to give optimum channel performance utilising 725/6 Pre-emphasis curve, with little or no reduction in video bandwidth and performance.

The transmitter is housed in a rugged weathersealed, alu-chromed, milled housing with LEMO multipin, BNC and N type connectors. The unit has an extended base plate for panel or wall fixing, or alternatively for installing into the LMW MDR400S Camera Outstation. High and low power outputs can be selected for optimum power efficiency.



The transmitter design uses a crystal-referenced, microcontrolled, programmable multi-channel synthesiser, at output frequency for spectral purity, efficiency and linearity. The video processing uses very tight filtering to optimise the channel bandwidth and has power GaAsfet technology in the output stages for efficiency and cleanliness. Audio bandwidth is optimised for high quality audio techniques.

2.1 Connectors

Power	LEMO	- 4 Pin plug Part No. FGGIB304C
Video input	BNC	- 75Ω - various
Audio - single channel	LEMO	- 5 Pin Plug Part No. FGGIB305C
Audio - dual channel	LEMO	- 5 pin Plug Part No. FGGIB305C

2.2 Use

This transmitter is suited to applications where the best range (several kilometres) is required without drawing excessive DC current combined with a rugged housing which will withstand being out in wet and dusty conditions. All the connectors are water resisting, but some extra protection may be needed for the BNC video cable.

Suggested antennas for this unit are the AE03, AE07, AE08 and AE04 (or suitable Directional or Omnidirectional 50Ohm S-Band antenna).

The unit has channel change facility built in. To access this, remove the top cover, the one with the label on, and locate the miniature rotary switch. Rotate this selector until the desired channel number is displayed. Replace the lid.

To switch to low power, the Hi/Lo is connected to ground (connect BLUE (Pin 1) to 0V), which will reduce the DC input current by approx 300mA, the output power dropping to approx 150mW.

The audio inputs are 600Ω balanced or unbalanced.

The unit is also designed to bolt straight into the MDR400S camera control outstation. All necessary leads are supplied with the outstation.

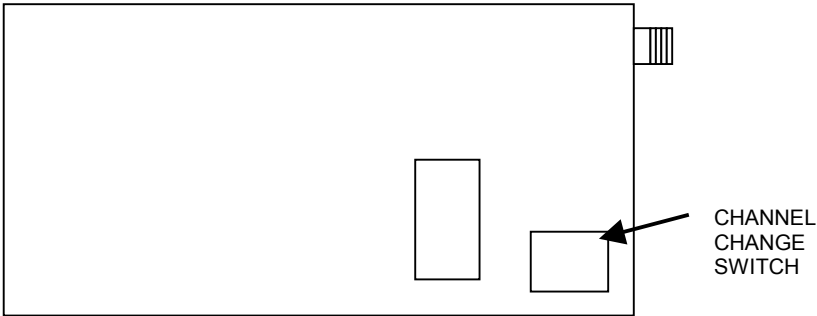


Figure i: Location of channel change switch on VT2400SC2D

2.3 Typical connections

2.3.1 Power connections

Function	Wire Colour	Pin number
GND	Black	2
12V	Red	4
Hi/Low Power	Blue	1

Table i : VT2400SC2D Power Connections

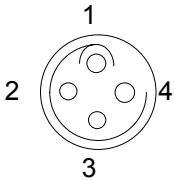


Figure ii : 4 Pin LEMO pin out orientation viewed from solder spill (wiring side) side

CAUTION

These points should be noted when the VT2400SC2D is used on its own without the MDR400S camera outstation.

1. The Antenna should always be connected before the transmitter is switched on. Also the antenna and interconnecting Coax cable should be of a good VSWR. Always use good low loss cable such as RG400, RG213, RG8, and 9913F, etc. And make sure the connectors are terminated correctly.
2. When the VT2400SC2D is used with a stand alone, 12v DC source. **Please select a Power Supply of a suitable standard as to supply a continuous current of 2 Amps, fully regulated, and handle a switch-on current in excess of 5 Amps accurately.** Failure to do this will result in an over-voltage surge, causing the internal PCB fuze to blow. A reverse supply is catered for, with a series diode, but **caution, any voltage in excess of 16V** will cause the internal protection circuit to take out the fuze, protecting the more sensitive circuits in the transmitter. Please refer to the Manufacturer or Agent if you are unsure. If the Internal fuze does blow, or the Transmitter fails to give satisfactory results, the unit should be returned to your Agent, or Authorised Service Engineer.

2.3.2 One Sound Channel Fitted SCREENED LEAD

Function	Wire Colour	Pin number
AF In	Red	2
AF In	Blue	3
GND	Screen	1

Table ii : VT2400SC2D Single Sound Channel Connections

To use with an unbalanced input leave the BLUE wire unconnected.

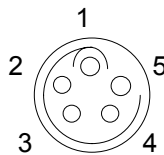


Figure iii : 5 Pin LEMO pin out orientation viewed from solder spill (wiring side) side

2.3.3 Twin Sound Channels Fitted SCREENED LEAD

Function	Wire Colour	Pin number
AF In Ch. 1	Red	2
AF In Ch 1	Blue	3
AF In Ch. 2	Green	4
AF In Ch 2	Yellow	5
GND	Screen	1

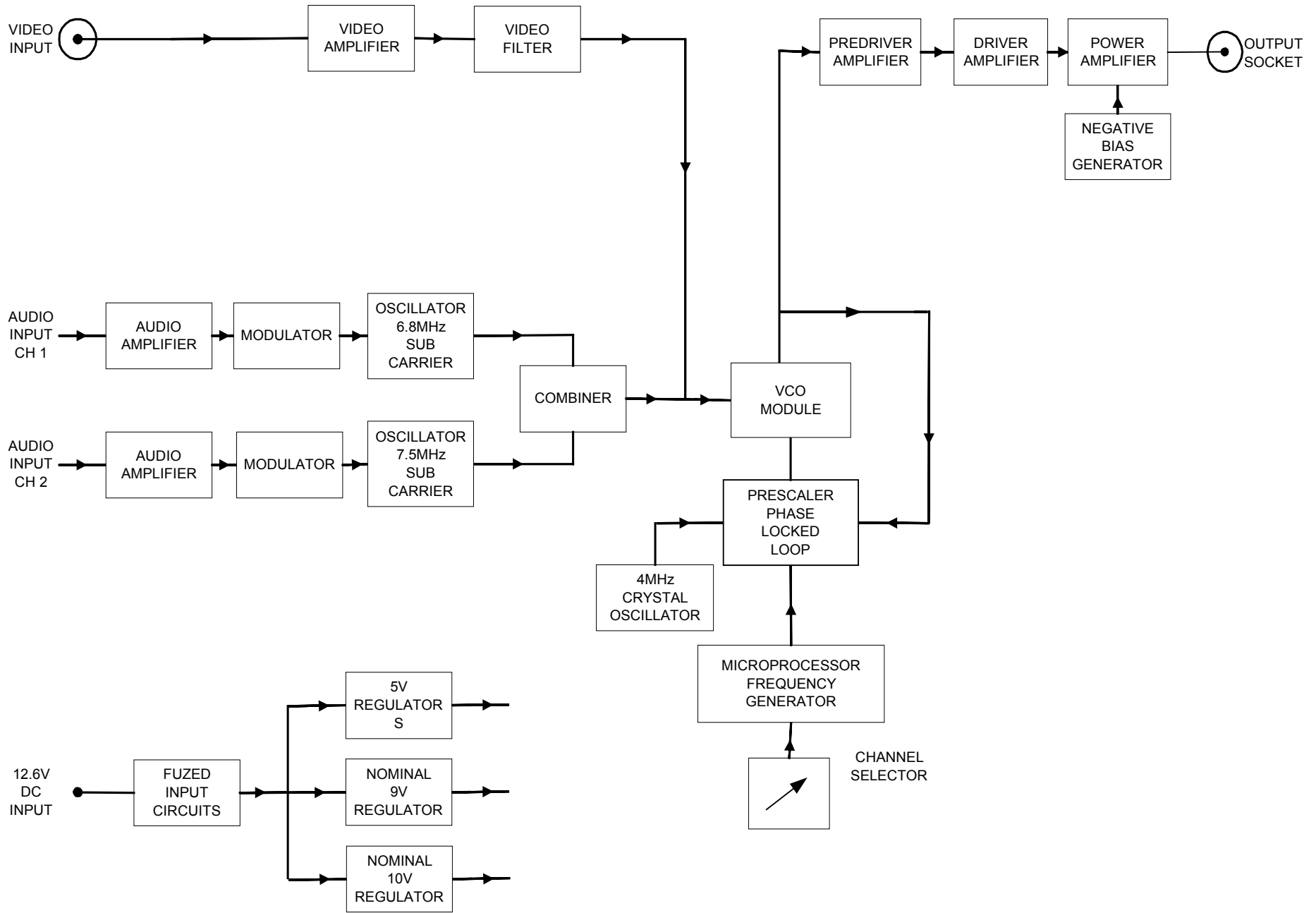
Table iii : VT2400SC2D Twin Sound Channel Connections

To use with an unbalanced input leave RED and YELLOW wires unconnected.

2.4 Specifications

DC connection	LEMO
RF connection	50Ω, "N" socket
Audio Connections	LEMO
Video Input	75Ω, BNC
Video Bandwidth	20Hz to 5.5MHz, ±1dB
Audio Input (opt.)	1V pk to pk into 600Ω unbalanced
Audio Bandwidth (opt.)	50Hz to 10KHz ±1dB
Audio Subcarriers	6.8MHz & 7.5MHz
Audio Pre-emphasis	50μS
Carrier Frequencies	2.458GHz & 2.474GHz
RF Power out.	1.5W +3dB -1dB
Spurious Outputs	Better than -60dBW
Frequency Stability	Better than ±30ppm.
No. of RF Channels	Up to 16
DC Input	10.7V to 14.6V @ <1.2A
Deviation	Adjustable, 0 to 8MHz
Channel Bandwidth	12MHz
Video Pre-emphasis	725-6 or CCIR 405
Operational Temperature- Range	-30 to +50°C
Dimensions	150 x 95 x 30mm / 180mm with fixing plate

3. BLOCK DIAGRAM FOR VT2400SC2D VIDEO TRANSMITTER



4. LIMITED WARRANTY STATEMENT

This limited warranty applies only to LMW Electronics Ltd., product Distributor in the United States.

What is covered:

Any defect in materials or workmanship.

LMW Electronics Ltd U.S.Distributor does not warrant the operation of any VT Video Transmitters to be uninterrupted or error-free.

For how long:

One Year.

What we will do:

If your Video Transmitter is defective and returned within 30 days of the date it was purchased, we will replace it at no charge to you. If returned after 30 days but within one year of the date of purchase, we will repair it, or, at our option, replace it at no charge to you.

If we repair your Video Transmitter, we may use new or reconditioned parts. If we choose to replace your Video Transmitter, we may replace it with a new or reconditioned one of the same or similar design or functionality. The repair or replacement will be warranted for either (a) 90 days or (b) the remainder of the original one-year warranty period, whichever is longer,

Limitations:

IMPLIED WARRANTIES, INCLUDING THOSE OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY (AN UNWRITTEN WARRANTY THAT THE PRODUCT IS FOR ORDINARY USE), ARE SPECIFICALLY LIMITED TO ONE YEAR FROM THE DATE OF PURCHASE OF YOUR VIDEO TRANSMITTER AND THEREAFTER ARE SPECIFICALLY DISCLAIMED. WE WILL NOT PAY FOR THE LOSS OF TIME, INCONVENIENCE, LOSS OF USE OF YOUR VIDEO TRANSMITTER, OR PROPERTY DAMAGE CAUSED BY YOUR TRANSMITTER OR ITS FAILURE TO WORK, OR ANY DIRECT OR INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING LOST PROFITS.

NEITHER LMW ELECTRONICS LTD., OR ITS U.S. DISTRIBUTOR NOR ANY CREATOR OF SOFTWARE OR FIRMWARE USED IN CONNECTION WITH THE VIDEO TRANSMITTER MAKE ANY WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO ANY SOFTWARE OR FIRMWARE USED IN CONNECTION WITH THE VIDEO TRANSMITTER, NOR DO THEY WARRANT THAT ANY SUCH SOFTWARE OR FIRMWARE WILL MEET YOUR SPECIFIC REQUIREMENTS. BY USING THE VIDEO TRANSMITTER, YOU HEREBY AGREE TO ASSUME THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF ANY SOFTWARE OR FIRMWARE USED IN CONNECTION WITH THE VIDEO TRANSMITTER. IN NO EVENT SHALL LMW ELECTRONICS LTD., OR ITS U.S. DISTRIBUTOR OR ANY CREATOR OF SOFTWARE OR FIRMWARE USED IN CONNECTION WITH THE VIDEO TRANSMITTER BE LIABLE TO YOU FOR ANY DAMAGES, INCLUDING LOST PROFITS, LOST SAVINGS OR OTHER DIRECT, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE SOFTWARE OR FIRMWARE USED IN CONNECTION WITH THE VIDEO TRANSMITTER, OR FOR ANY CLAIM BY ANOTHER PARTY.

What we ask you to do:

To get warranty service for your Video Transmitter, you must provide proof of the date of purchase. Within 30 days of the date it was purchased, return your Video Transmitter to your place of purchase for immediate replacement. After 30 days, but within the warranty period described in the second paragraph of "What we will do" above, return your Video Transmitter to your place of purchase for repair or, at our option, replacement at no charge to you. You must ship your Video Transmitter to us prepaid and insured. We suggest you retain your original packing material in the event you need to ship your Video Transmitter. When sending your Video Transmitter to your place of purchase for service, include your name, address, phone number, proof of purchase and a description of the

operating problem. After repairing or replacing your Video Transmitter, we will ship it to you within the United States at no cost to you. Warranty service is available only in the United States and only during U.S. Distributor normal business hours. Repair or replacement of your Video Transmitter at your place of purchase is your exclusive remedy.

What this warranty does not cover:

This limited warranty covers only those defects which arise as a result of normal use of the Video Transmitter. This limited warranty does not cover defects resulting from accidents, negligence, damage while in transit to your place of purchase or service, alterations, modifications, unauthorised repairs, failure to follow instructions or safety precautions, improper installation, improper maintenance, abuse, misuse, mishandling, fire, flood, earthquake, lightning and acts of God. If your Video Transmitter is not covered by our warranty, you may write to the U.S. Distributor for advice as to whether we will repair your Video Transmitter and any other repair information, including charges. We, at our option, may replace rather than repair your Video Transmitter with a new or reconditioned one of the same or similar design and functionality. The repair or replacement will be warranted for either (a) 90 days or (b) the remainder of the one year warranty period, whichever is longer.

THIS LIMITED WARRANTY IS EXCLUSIVE AND IS THE ONLY WARRANTY OFFERED ON YOUR VIDEO TRANSMITTER, AND IT SETS FORTH ALL OF OUR RESPONSIBILITIES REGARDING YOUR VIDEO TRANSMITTER. THERE ARE NO OTHER EXPRESS OR IMPLIED WARRANTIES WITH RESPECT TO YOUR VIDEO TRANSMITTER OTHER THAN THIS LIMITED WARRANTY. NO ORAL OR WRITTEN INFORMATION OR ADVICE GIVEN BY THE U.S. DISTRIBUTOR, ITS AGENTS OR EMPLOYEES SHALL CREATE OR IN ANY WAY INCREASE THE SCOPE OF THIS WARRANTY.

Service after the warranty period:

After your warranty period has expired, you can obtain a Maintenance Agreement by writing to the U.S. Distributor. We recommend that you write 90 days prior to the expiration on your warranty period.

State Law Rights:

This Limited Warranty Statement gives you specific legal rights, and you may also have other rights which may vary from state to state.

TO THE EXTENT THAT THIS LIMITED WARRANTY STATEMENT IS INCONSISTENT WITH THE LAW OF THE LOCALITY WHERE YOU USE THE VIDEO TRANSMITTER, THIS LIMITED WARRANTY STATEMENT SHALL BE DEEMED MODIFIED TO BE CONSISTENT WITH SUCH LOCAL LAW. UNDER SUCH LOCAL LAW, CERTAIN LIMITATIONS OF THIS LIMITED WARRANTY STATEMENT MAY NOT APPLY TO YOU. FOR EXAMPLE, SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS OR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSIONS OR LIMITATIONS MAY NOT APPLY TO YOU. TO THE EXTENT ALLOWED BY LOCAL LAW, THE REMEDIES PROVIDED IN THIS LIMITED WARRANTY STATEMENT ARE YOUR SOLE AND EXCLUSIVE REMEDIES.

5. IDENTIFICATION AND APPROVAL LABELS

6. WARRANTY REGISTRATION DOCUMENT

This form should only be returned if you have not purchased the equipment directly from the manufacturers.

Company Name:
Company Address:
Post Code: (Zip Code)
Your Contact Name:
Date Of Purchase:
Suppliers Name:
Product Type
Serial Number

Please Fax this back to us on the number shown on the title page of this manual. We will acknowledge receipt as soon as possible.