



PCM55
NTSC

**AUDIO &
VIDEO
MODULATOR**

Installation

And

Operation

Manual

SAFEGUARDS

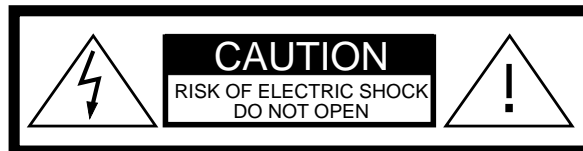
Important Information

Product Inspection

Inspect the equipment for shipping damage. Should any damage be discovered, immediately file a claim with the carrier.

Important Safety Instructions

To ensure proper installation and operation, take a moment to read this guide before proceeding with the installation. If you have any questions or comments about the **PCM55** modulator, please contact your dealer or have him contact the **PICO MACOM** Service Center at the phone numbers at the bottom of the page.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. DO NOT OPEN THE CABINET, REFER SERVICING TO QUALIFIED PERSONNEL ONLY.

CAUTION: TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

ATTENCION: POUR PREVENIR LES CHOCS ELECTRIQUES, NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR, UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.

1. Read Instructions - All safety and operating instructions should be read before the appliance is operated.

2. Retain Instructions - The safety and operating instructions should be retained for future reference.

3. Heed Warnings - All warnings on the appliance should be adhered to.

4. Follow Instructions - All operating and user instructions should be followed.

5. Cleaning - Unplug this appliance from the wall outlet before cleaning. Use a damp cloth for cleaning. Do not use liquid cleaners or aerosol cleansers.

6. Do Not Use Attachments - not recommended by the manufacturer or they may cause hazards.

7. Water and Moisture - Do not use this product near water - for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool - and the like.

8. Accessories - Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the appliance.

9. Ventilation - This video product should never be placed near or over a radiator or heat register. This video product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to. Any slots or opening in the cabinet are provided for ventilation. To ensure reliable operation of the video product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface.

SAFEGUARDS

Important Information

10. Grounding or Polarization - This video product is equipped with either a three prong plug for 110 VAC use or a two prong flat blade 220 volt type plug. Each type is to be inserted into only the type of receptacle for which they specifically designed. **Do not** cut off the round grounding pin in order to be able to fit into a two prong receptacle as this could cause injury and will void the warranty.

11. Power Sources - This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied to your home, consult your appliance dealer or local power company.

12. Power-cord Protection - Power-supply cords should be routed so they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords and plugs, convenience receptacles, and the point where they exit from the appliance.

13. Lightning - For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet.

14. Power Lines - An outside antenna system should not be located in the vicinity of overhead power lines, other electric light or power circuits, where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them may be fatal.

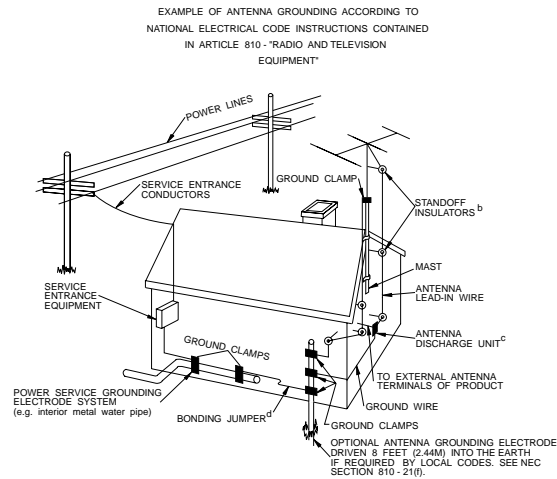
15. Overloading - Do not overload wall outlets and extension cords as this can result in risk of fire or electric shock.

16. Object and Liquid Entry - Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

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

18. Damage Requiring Service - Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- When the power-supply cord or plug is damaged.
- If liquid has been spilled, or objects have fallen into the product.
- If the product has been exposed to rain or water.
- If the product does not operate normally by following the operating instruction. Adjust only those controls that are covered by the operating instructions. An improper adjustment may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
- If the product has been dropped or the cabinet has been damaged.
- When the product exhibits a distinct change in performance - this indicates a need for service.



19. Replacement Parts - When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original parts. Unauthorized substitutes may result in fire, electric shock or other hazards.

20. Safety Check - Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating conditions.

21. Outdoor Antenna Grounding - Before attempting to install this product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges.

- Use No.10 AWG (5.3mm) copper, No.8 AWG (8.4mm aluminum, No.7 AWG (10mm) copper-clad steel or bronze wire or larger, as ground wire.
- Secure antenna lead-in and ground wires to house with stand-off insulators spaced from 4 feet (1.22m) to 6 feet (1.83m) apart.
- Mount antenna discharge unit as close as possible to where lead-in enters house.
- A driven rod may be used as the grounding electrode where other types of electrode systems do not exist. Refer to the National Electrical Code, ANSI/NFPA 70-1984 for information.
- Use jumper wire not smaller than No.6 AWG (13.3mm) copper or equivalent, when a separate antenna grounding electrode is used.

NOTE TO THE CATV SYSTEM INSTALLER:

THIS REMINDER IS PROVIDED TO CALL THE CATV SYSTEM INSTALLER'S ATTENTION TO ARTICLE 820 - 22 OF THE NEC THAT PROVIDES GUIDELINES FOR PROPER GROUNDING AND, IN PARTICULAR, SPECIFIES THAT THE CABLE GROUND SHALL BE CONNECTED TO THE GROUNDING SYSTEM OF THE BUILDING, AS CLOSE TO THE POINT OF CABLE ENTRY AS PRACTICAL.

DESCRIPTIONS

Description and Specifications

The **Pico Macom Inc. PCM55** modulator provides a modulated visual and aural RF carrier output on any single lowband, midband, or superband channel. An improved manufacturing process and high quality components assure years of trouble free operation. Multi-section LC filtering has been added to make the unit adjacent

channel compatible. This unit supplies high quality video, color, and sound signals on any unused channel within a closed circuit MATV or SMATV system. The modulator is shipped with all internal adjustments preset and is provided with separate external modulation and RF level controls.

Features

- All Band Design: VHF (2-13), Midband (A-I), Superband (J-W)
- Excellent audio and video linearity

- Separate modulation and RF level controls
- 110 VAC version UL and CSA Listed
- Power On Front Panel Indicator

Specifications

RF

Output Channels 2-36, STD, IRC, HRC and FCC docket 21006 offsets
Frequency Range 54-300 MHz
Output Level + 55 dBmv
Output Adjustment Range 12 dB
Spurious Output -60 dB @ 55 dBmv output (A/V carrier -15 dB)

Sideband Filter Response @ 87% Modulation

Frequency MHz	Low Band	Mid & High Band	Superband J - W
Fv -4.5	-60dB	-60dB	-55dB
Fv -3.0	-45dB	-40dB	-30dB
Fv -1.5	-40dB	-40dB	-20dB
Fs +1.0	-45dB	-40dB	-25dB
Fs +3.0	-45dB	-40dB	-28dB
Fs +4.5	-60dB	-60dB	-55dB

Frequency Stability ± 10 kHz, ± 5 kHz Aeronautical (conforms to FCC requirements)

Offsets Pre-set +12.5 kHz or +25 kHz on FCC specified channels (Special Offsets Available)

Audio/Video Ratio -7 dB to -18 dB (preset @ -15 dB)

Video

Input Level 0.5 V p-p minimum for 87.5% modulation
Input Type Composite Video, negative sync.
Visual C/N 58 dB @ 4 MHz BW
Hum and Noise -55 dB @ 87.5% modulation
Frequency Response ± 1.5 dB 30 Hz to 4 MHz
Differential Gain less than 5%
Differential Phase less than 5°
Group Delay .. 75 nsec (conforms to FCC requirements)

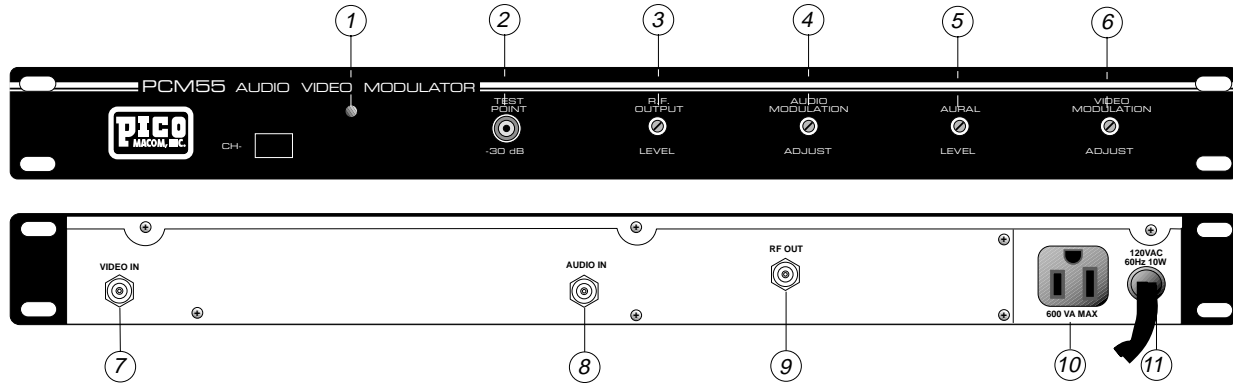
Audio

Input Impedance 600 ohms unbalanced
Baseband input 0.5 Vp-p for 25 kHz deviation
Pre-emphasis 75 microseconds
Flatness 1.5 dB max 50 Hz to 15 kHz
Frequency Response 15 Hz to 15 kHz
Subcarrier Frequency +4.5 MHz ± 10 kHz

General

AC Power 108 to 125 VAC, 60 Hz
220VAC, 60 Hz
Weight 2.5 Pounds
Dimensions 19"W x 1.75"H x 3"D
Operating Temperature 0 to 50 Degrees C

Front & Rear Panels



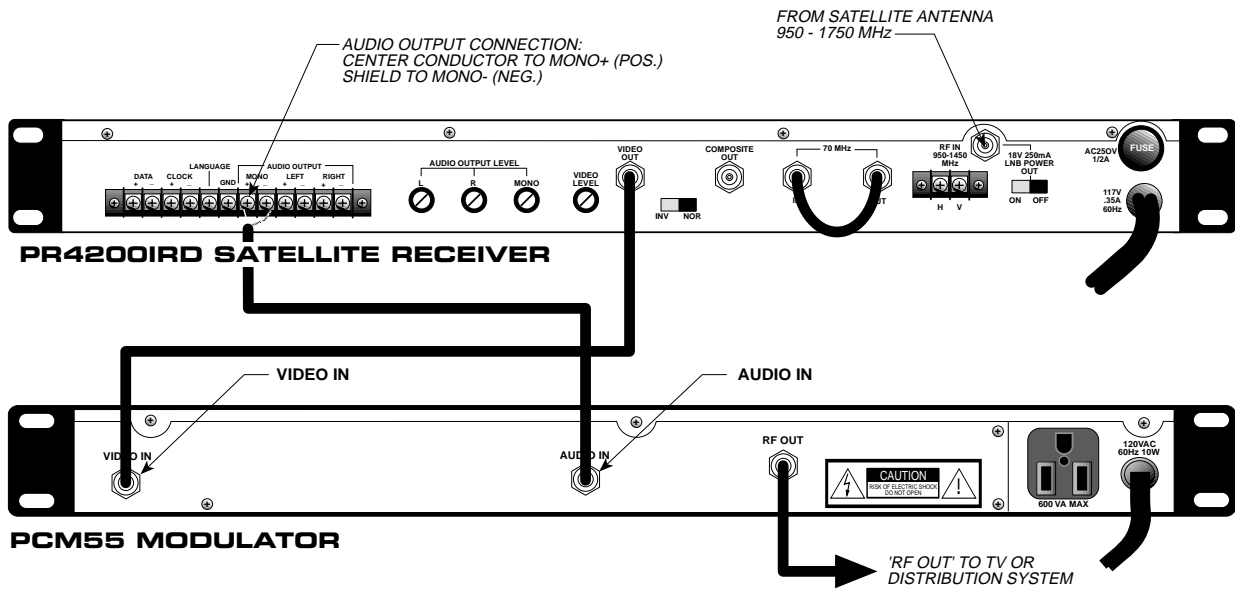
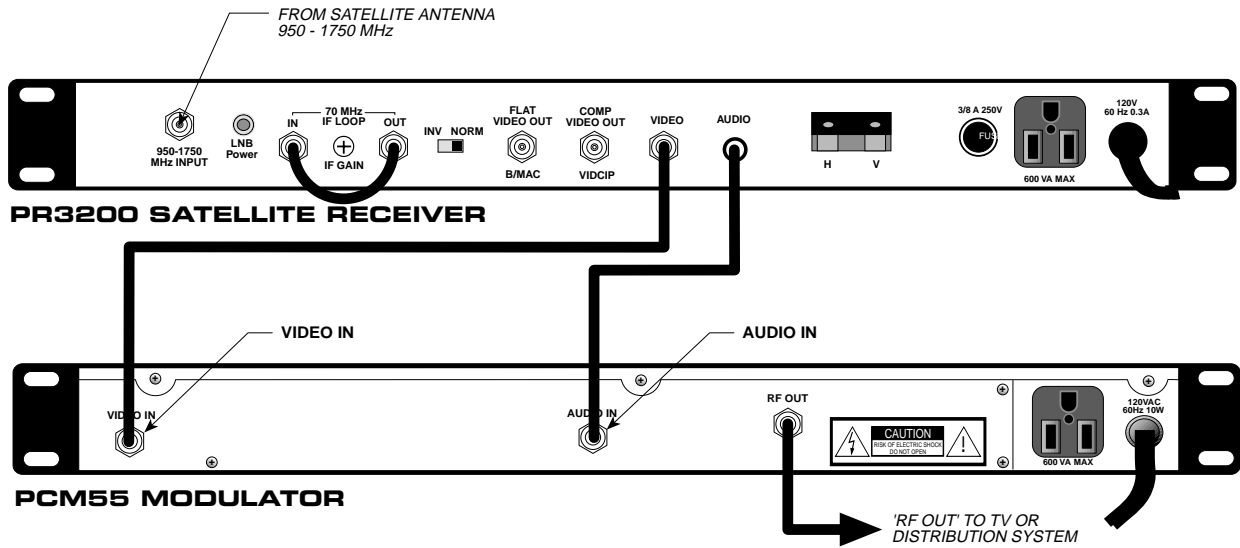
The **PCM55** modulator is a crystal controlled modulator. The modulator's operating frequency is determined by the frequency of a high accuracy temperature compensated crystal. The video is applied through a front panel controlled potentiometer to an integrated circuit. The amount of video applied to the IC determines the depth of modulation. A surge

protection circuit is connected to the video input to protect the IC from high level inputs. The audio is coupled through a front panel controlled potentiometer to a high impedance input transistor. This buffer circuit isolates the IC from the input, and eliminates the need for special impedance matching. Additionally, input surge protection is provided.

- 1. Power On Indicator:**
The LED indicates unit is operating.
- 2. Test Point:**
The -30 dB RF output test point is used to set the RF output level and monitor channel performance.
- 3. RF Output Level:**
This rugged PC Board mounted control sets the RF output level.
- 4. Audio Modulation:**
The heavy duty PC mounted control is used to set the audio modulation level.
- 5. Aural Level:**
This potentiometer controls the level of the audio RF carrier.
- 6. Video Modulation Adjust:**
The PC Board mounted control is used to set the video modulation level.
- 7. Video In:**
The PC Board mounted "F" connector accepts the negative sync video information from a satellite receiver or VCR.
- 8. Audio In:**
The audio from the satellite receiver or VCR is connected to this PC Board mounted F connector.
- 9. RF Out:**
The modulated output signal is available on this PC Board mounted "F" connector.
- 10. Convenience Outlet:**
Allows looping of power between units.
- 11. Power Cord:**
The three prong type power plug connects to a 120 VAC, 60 Hz electrical output or if 220VAC, 60 Hz, a two prong flat blade type is used.

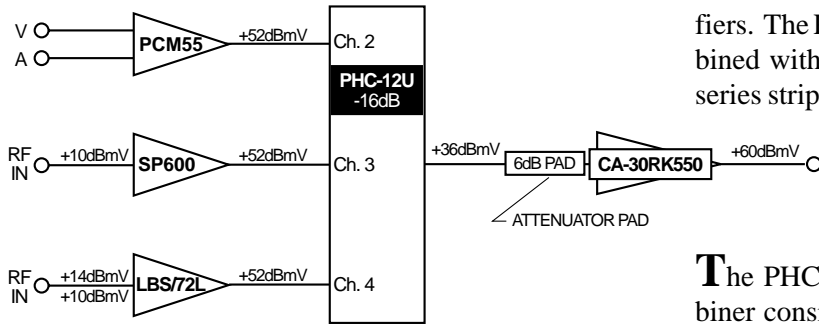
INSTALLATION

Satellite Receiver - 110 VAC Version



INSTALLATION

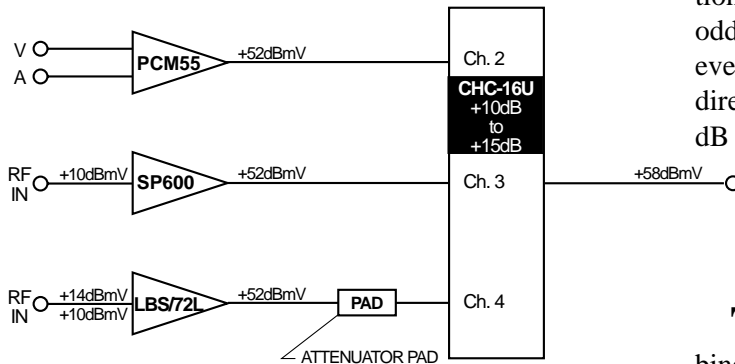
Signal Combining Methods



The output levels of the modulator should be the same as the output of the off-air strip amplifiers. The PCM55 modulators are usually combined with either the SP600, LBS/HBS or 72 series strip amplifiers. Three methods are suggested to combine strip amplifier modulator and processor outputs.

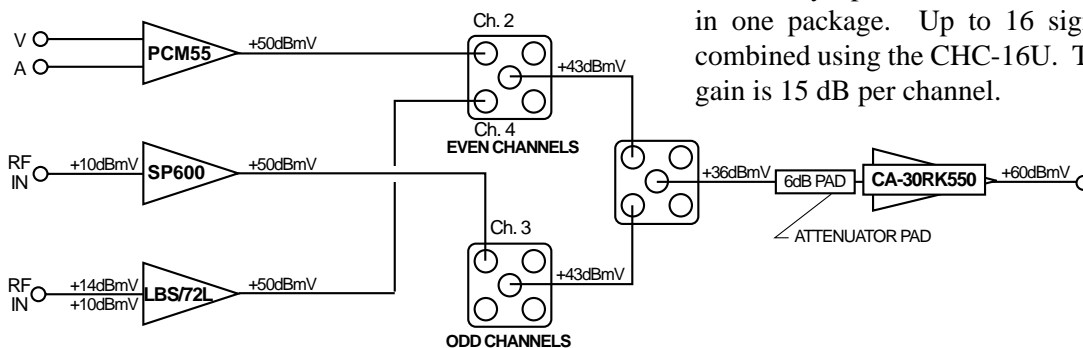
Method 1

The PHC-12U twelve channel passive combiner consists of two rows of directional couplers combined by a hybrid splitter. The directional coupler combining provides high isolation (40 dB) between the inputs. Normally the odd channels are combined on one row while even channels are combined on the other row of directional couplers. The combiner loss is 16 dB per channel.



Method 2

The CHC-16U sixteen channel active combiner provides both signal combining and post amplification of the headend signals. The unit is basically a passive combiner and a CA30 in one package. Up to 16 signals may be combined using the CHC-16U. The combined gain is 15 dB per channel.



Method 3

The final method of combining signals uses three hybrid splitters per headend rack. The odd channels are combined in one splitter, the even-channels in another splitter and the two splitters are combined to a single output with a third splitter. Each rack is then combined with a final splitter prior to the CA-30RK550 post amplifier.

Note: (*) denotes either LBS, MBS, HBS or FMS strip amplifiers.

ALIGNMENT

Channel Crystal Frequency

FCC OFFSET kHz	CHANNEL NUMBER	PICTURE CARRIER	NORMAL CRYSTAL Freq MHz	INVERTED CRYSTAL Freq MHz	Harmonic. Number
	2	..... 55.25	27.625	29.875	2
	3	..... 61.25	30.625	32.875	2
	4	..... 67.25	33.625	35.875	2
	5	..... 77.25	38.625	40.875	2
	6	..... 83.25	41.625	43.875	2
+25	A-1	..... 115.275	28.81875	29.94375	4
+25	A-2	..... 109.275	27.31875	28.44375	4
	7	..... 175.25	35.050	35.950	5
	8	..... 181.25	36.250	37.150	5
	9	..... 187.25	37.450	38.350	5
	10	..... 193.25	38.650	39.550	5
	11	..... 199.25	39.850	40.750	5
	12	..... 205.25	41.050	41.950	5
	13	..... 211.25	42.250	43.150	5
+12.5	A 14	..... 121.2625	30.315625	31.440625	4
+12.5	B 15	..... 127.2625	31.815625	32.940625	4
+12.5	C 16	..... 133.2625	33.315625	34.440625	4
	D 17	..... 139.25	34.8125	35.9375	4
	E 18	..... 145.25	36.3125	37.4375	4
	F 19	..... 151.25	37.8125	38.9375	4
	G 20	..... 157.25	39.3125	40.4375	4
	H 21	..... 163.25	40.8125	41.9375	4
	I 22	..... 169.25	42.3125	43.4375	4
	J 23	..... 217.25	36.2083	36.958333	6
+12.5	K 24	..... 223.2625	37.210375	37.960417	6
+12.5	L 25	..... 229.2625	38.210375	38.960417	6
+12.5	M 26	..... 235.2625	39.210375	39.960417	6
+12.5	N 27	..... 241.2625	40.210375	40.960417	6
+12.5	O 28	..... 247.2625	41.210375	41.960417	6
+12.5	P 29	..... 253.2625	42.210375	42.960417	6
+12.5	Q 30	..... 259.2625	43.210375	43.960417	6
+12.5	R 31	..... 265.2625	44.210375	44.960417	6
+12.5	S 32	..... 271.2625	45.210375	45.960417	6
+12.5	T 33	..... 277.2625	46.210375	46.960417	6
+12.5	U 34	..... 283.2625	47.210375	47.960417	6
+12.5	V 35	..... 289.2625	48.210375	48.960417	6
+12.5	W 36	..... 295.2625	49.210375	49.960417	6

WARRANTY

Five Year Limited Warranty*

Pico Macom, Inc. warrants to the original purchaser this product shall be free of defects in material and craftsmanship with only the limitations or exclusions set out below.

During the warranty period Pico Macom Inc. or an authorized Pico Macom service facility will provide free of charge, the parts and labor necessary to correct defects in material and workmanship.

WARRANTY DURATION

This warranty shall terminate five years* from the original date of purchase of the product or at a time the product is:

1. Misused or damaged due to neglect or improper installation
2. Modified
3. Repaired by someone other than the warrantor
4. Sold by the original purchaser

STATEMENT OF REMEDY

To obtain warranty service, contact the salesperson where the product was obtained. You will be issued a Return Authorization (RA)

number which will be used to track your product.

Be prepared to provide:

1. The model number and channel number of the product
2. The date of purchase
3. A specific identification of the problem

Deliver the products to Pico Macom Inc. or ship the products in the original packing material at the address at the bottom of the page. Include satisfactory evidence of the date of purchase.

Products will not be accepted by Pico Macom Inc. without the RA number clearly indicated on the shipping label.

The foregoing constitutes the Pico Macom, Inc. entire obligation with respect to this product and the original purchaser and any user or owner shall have no other remedy and no claim for incidental or consequential damages. ***Some states do not allow limitations on how long an implied warranty lasts or do not allow the exclusions or limitation of incidental or consequential damages, so the above limitation and exclusion may or may not apply to you.***

This warranty gives you specific legal rights, and you also have rights which vary from state to state.

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