TP-5000 Series User Manual

Model TP-5116 (VHF)
Model TP-5416 (UHF)
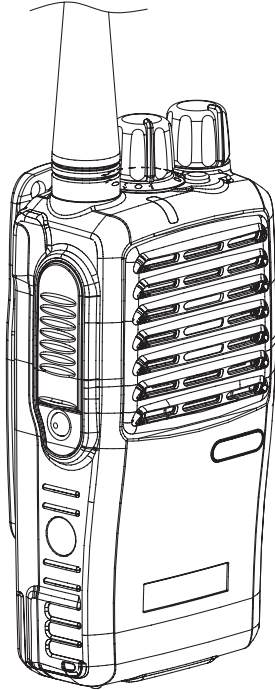
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SPECIFICATIONS

MODEL: TP-5116

GENERAL

Dimensions (Less Antenna) H x W x D	4.42" × 2.2" × 1.25" / 112.2 mm × 56 mm × 31.9 mm
Weight	
Radio (less battery)	4.3 oz. / 122 g.
with battery (2200mAH)	8.8 oz. / 249 g.
Programmable Channels	16 Channels
Channel Spacing	12.5 / 25 kHz
Power Source	7.5V DC Rechargeable Li-ion 2200 mAh battery pack
Current Drain (maximum)	
Receive Standby mode	65 mA
Receive Full Audio	350 mA
Transmit at 5 Watts	1.6 A

TRANSMITTER

Frequency Range	136 ~ 174 MHz
Frequency Stability	±2.5 ppm (-30 to +60℃)
RF Power Output	5 Watts / 2 Watts
Spurious and Harmonic	-65dB
FM Hum and Noise	40dB (12.5 kHz), 45dB (25 kHz)
Audio Distortion	5% maximum
Audio Frequency Response	+1, -3dB from 6dB per octave pre-emphasis
	Characteristic from 300 ~ 3000Hz

RECEIVER

Frequency Range	136 ~ 174 MHz
Sensitivity	.282uV 12 dB SINAD
Squelch Sensitivity	.25uV 10dB SINAD
Selectivity	60dB (12.5KHz), 70dB (25KHz)
Spurious and Harmonic Rejection	70dB
Inter-modulation	60dB
FM Hum and Noise	40dB
Audio Output Power	1 Watt across a 16-ohm load
Audio Distortion	Less than 5% at rated output
Audio Response	+1, -3 dB from 6dB per octave de-emphasis
	Characteristic from 300 ~ 3000Hz

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SPECIFICATIONS

MODEL: TP-5416

GENERAL

Dimensions (Less Antenna) H x W x D	4.42" × 2.2" × 1.25" / 112.2 mm × 56 mm × 31.9 mm
Weight	
Radio (less battery)	4.3 oz. / 122 g.
with battery (2200mAH)	8.8 oz. / 249 g.
Programmable Channels	16 Channels
Channel Spacing	12.5 / 25 kHz
Power Source	7.5V DC Rechargeable Li-ion 2200 mAh battery pack
Current Drain (maximum)	
Receive Standby mode	60 mA
Receive Full Audio	350 mA
Transmit at 4 Watts	1.4 A

TRANSMITTER

Frequency Range	400 ~ 470 MHz
Frequency Stability	±2.5 ppm (-30 to +60℃)
RF Power Output	4 Watts / 2 Watts
Spurious and Harmonic	-65dB
FM Hum and Noise	40dB (12.5 kHz), 45dB (25 kHz)
Audio Distortion	5% maximum
Audio Frequency Response	+1, -3dB from 6dB per octave pre-emphasis
	Characteristic from 300 ~ 3000Hz

RECEIVER

Frequency Range	400 ~ 470 MHz
Sensitivity	.282uV 12 dB SINAD
Squelch Sensitivity	.25uV 10dB SINAD
Selectivity	60dB (12.5KHz), 70dB (25KHz)
Spurious and Harmonic Rejection	70dB
Inter-modulation	60dB
FM Hum and Noise	40dB
Audio Output Power	1 Watt across a 16-ohm load
Audio Distortion	Less than 5% at rated output
Audio Response	+1, -3 dB from 6dB per octave de-emphasis
	Characteristic from 300 ~ 3000Hz

TP-5116 and TP-5416 RADIO MODEL NUMBERS

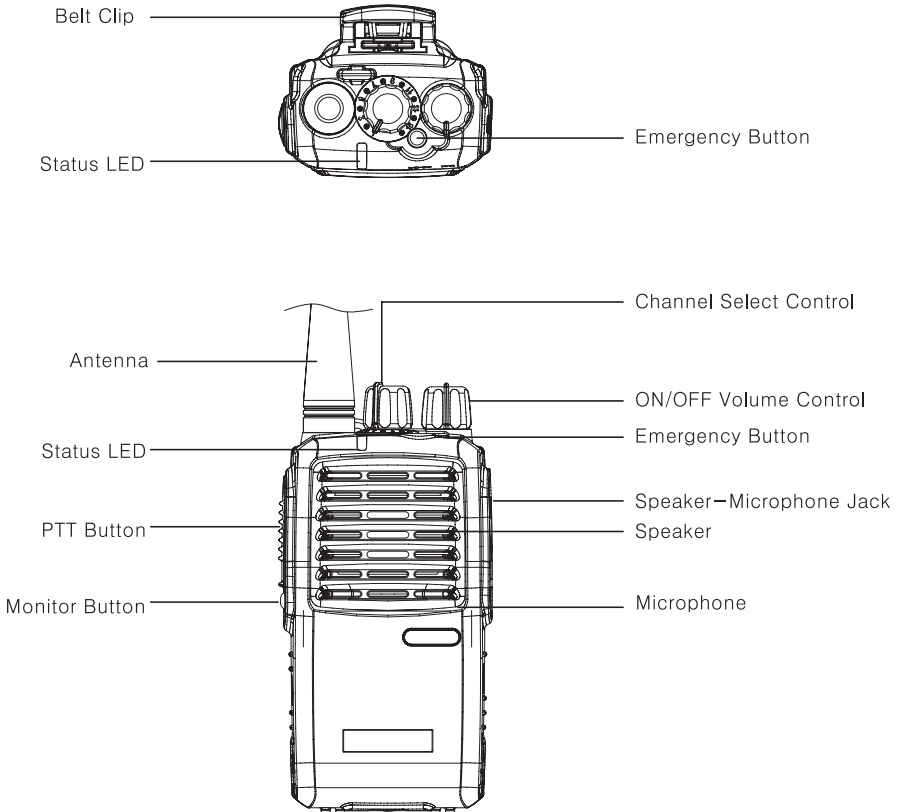| Model Number	Description
TP-5116	16 Channel, 5 Watt, VHF 136 - 174 MHz Portable Radio
TP-5416	16 Channel, 4 Watt, UHF 400 - 470 MHz Portable Radio

FEATURES

The TP-5000 series is designed as a rugged and lightweight radio to deliver clear, reliable communications for your industrial or commercial needs.

This feature rich portable can be programmed for your specific application by an Authorized Maxon Sales and Service Dealer.

- 16 channels with optional voice annunciation
- CTCSS / DCS Tone capability
- Voice inversion scrambler
- Compander function
- Dual Tone Multi - Frequency (DTMF)
- Selectable channel spacing (12.5kHz / 25KHz)
- Normal scanning and priority scanning
- Time-Out Timer (TOT)
- 2-Tone paging decode
- Busy Channel Lock (BCL) / Busy Channel Lock Override (BCLO)
- High/Low transmit power
- 9 Step squelch control using RSSI (0~9)
- Remote radio Stun/Revive (Uses 5 Tone)
- Monitor
- VOX
- Cloning capability
- USB PC Programming
- PC Tuning

CONTROLS & INDICATORS

The following provides a description of the controls and indicators for the TP-5000 series radio. Detailed operating instructions are explained later in this document.

Belt Clip

Status LED

Emergency Button

Antenna

Status LED

PTT Button

Monitor Button

Channel Select Control

ON/OFF Volume Control

Emergency Button

Speaker – Microphone Jack

Speaker

Microphone

Controls

On/Off Volume Switch

Turn the volume control clockwise to turn the radio on and counter clockwise to turn the radio off. To increase the audio level, turn the control clockwise. By utilizing the index mark on the control knob, a relative volume setting can be visualized.

Channel Select Switch

Turn the Channel Select Switch clockwise to increase the channel number and counter clockwise to decrease the channel number. Channel annunciation is available via programming.

PTT Button

To put the radio into transmit mode, press the PTT button on the side of the radio. The LED on the top of the radio will illuminate red or amber (Depending on TX power setting). Releasing the PTT button places the radio into standby or receive mode. It is recommended to talk about 2- 3"(5-7cm) away from the microphone for optimum sound quality.

Side Button

This button can be programmed for many of the radio's features. Typically it is used for the monitor function.

Monitor Button (Side Button)

When the side button is software assigned as "Monitor", this function is activated.

The receiving status of the selected channel can be checked using the monitor button. Pressing the monitor button opens the squelch on the radio so any received audio can be heard.

Normal Mode: Press and hold of the monitor button for up to 2 seconds to monitor the channel for activity.

Continuous Mode: Press and hold the monitor button for more than 2 seconds, a beep tone is heard along with noise and the monitor function is continuously maintained. If the button is pressed again, the monitor function will be released.

Emergency (Red) Button

Typically this button is assigned as the "Emergency" button; however, it is programmable for many other functions.

If pressed, an emergency alert/siren sound will be heard through the speaker in the radio and will transmit an emergency signal to other receiving user(s) radio(s) via the emergency channel.

Speaker Microphone Jack

The speaker microphone jack on the side of the radio will be used to interface with external speaker microphone accessories and PC Programming/Cloning/Tuning.

Indicators

Status Indication LED

The users can recognize the current status of the TP-5000 series radio by the color of LED. The status indication will be as follows:

■ When transmitting on high power, the red LED will be on; when transmitting on low power, the amber LED will be on.

■ When receiving, the green LED will be on.

■ When the CTCSS tone or DCS code is not being received due to mismatch, the green LED will blink.

■ When low battery condition, the red LED will blink and an alert tone will be generated.

■ When in cloning mode, the amber LED will blink.

BATTERY PACKS

The following battery packs are available for use with the TP-5000 series radio.

■ TA-2200LI: Rechargeable Battery Packs (2200 mAh Li-ion)

■ TA-2600LI: Rechargeable Battery Packs (2600 mAh Li-ion)

The TP-5000 series Radio receives power from high-performance Li-ion batteries that are safe and highly reliable.

☞ CAUTION

It is recommended to only use authorized battery packs supplied by your Authorized Maxon Dealer or Maxon America, Inc.

Installing the Battery Pack
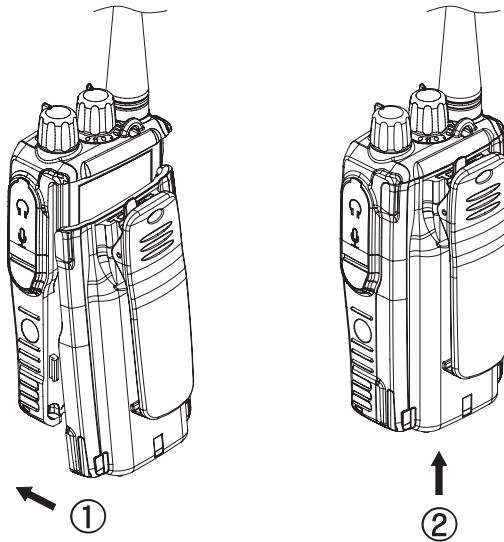
■ Ensure the ON/OFF volume switch is set to OFF position on the radio.
■ Hold the radio and battery pack with the back of them facing you. See Figure 1.
■ Align the hook back of the radio with the hook front side of the battery pack.
■ Press and slide the battery pack to the upper side of the radio until the battery release latch clicks into place.
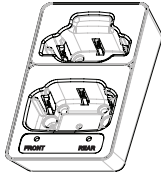
Removing the Battery Pack

Battery
Latch

① ②
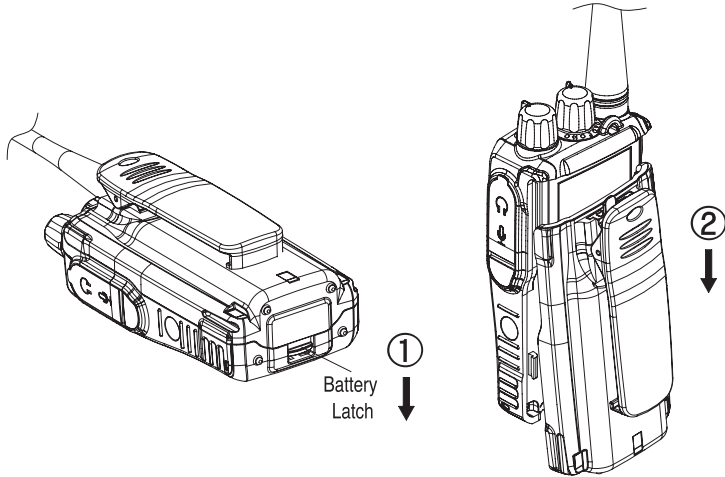
■ Ensure the ON/OFF volume switch is set to OFF position on the radio.

■ Press down the release latch and slide the battery pack down side of the radio.
See Figures 1 and 2.

RADIO OPERATIONS

Installation and Removal of Antenna

Place the antenna into the antenna connector of the radio and turn the antenna clockwise for installation of antenna. To remove the antenna from the radio, turn the antenna counterclockwise.

☞ **CAUTION**

When installing the antenna, refrain from applying strong pressure or over tightening.　Do not carry or pull on the antenna as this will damage the antenna and/or antenna connector, causing improper or failure of the radio operation.

Power On/Off

Turn power switch clockwise to turn radio on; an alert sound is heard indicating power is on. Turn Power switch counterclockwise to turn radio off.

☞ **CAUTION**

If turning power on while pressing a button on the radio, the radio may enter into a special mode, in this case transmitting and receiving may not be possible.

Transmission

Press the PTT button for transmission, transmitting can occur after red or amber LED is lit. If DTMF or 5 Tone is enabled in the programming of the radio, voice communication will not occur until after DTMF or 5 Tone tones are sent/completed.

☞ **CAUTION**

Transmit may be prohibited if the BCLO or TOT function is enabled.

Receiving

The radio operates in a receiving standby mode except for the transmitting period. The green LED is illuminated when the radio receives the RF signal. According to the settings of receiving and/or transmitting radio, the 2-Tone, DTMF, or 5 Tone tones can be heard.

If frequency is the same as current channel but sub-tone is not the same as current settings, the green LED will blink. In order to check if the current channel is in use, press the Monitor button (M) on the left side of radio. If pressing the Monitor button (M) for more than 2 seconds, the monitor function is activated with a "beep" sound. To release monitor function, press the monitor button again.

Changing Channels

The channel select switch is used for changing channels. Turn the Channel switch clockwise to increase the channel number. Turn the Channel switch counter-clockwise to decrease the channel number.

Adjusting Transmitting Power

The transmitting power can be selected to High-Power or Low-Power mode if a pre-assigned button is programmed in the radio. Battery life may be extended by switching to Low-Power mode; please note that enabling Low-Power mode may decrease the range of communications.

SCAN Operating mode

A Normal or Priority Scan function can be enabled if a pre-assigned button is programmed in the radio. If enabled, an alert "beep" sound will be heard and begin to check the RF signal at regular intervals. Press this button again and the SCAN function will be deactivated.

A scan channel list must be created before SCAN can be used. The radio will not go into SCAN mode when no scan channels are programmed. Please contact your Authorized Maxon Dealer for further information on scanning modes and operation.

Either the monitor button or the red button can be programmed by the dealer to start scan. To stop scan, press and hold the monitor button for 3 seconds then release the button.

Transmitting with SCAN Enabled

A choice of transmitting on home channel, last received channel, or current scan channel can be done per the programming of the radio. Please contact your Authorized Maxon Dealer for further information on scanning modes and operation.

Emergency Call

The Emergency Call (Red) button located on the top of the radio can be assigned through programming to transmitting an emergency alert tone or 5-Tone message in Sell-call mode. The user can also hear the emergency alert tone. If the radio is set up in repeat mode, the radio can also transmit the emergency alert tone periodically. Please contact your Authorized Maxon Dealer for further information on Emergency Call and its operation.

Monitor

In order to open the squelch manually, press the button which is pre-assigned by programming of the radio. If pressing the MON key for more than 2 seconds, the squelch is opened continuously with a "beep" sound. If you want to exit this mode, press the MON key shortly once again.

Subtone

The radio can be programmed for CTCSS and DCS encode/decode tones.

CTCSS Tone Frequency
A list of standard tone frequencies for CTCSS are shown below.

No.	Frequency	No.	Frequency	No.	Frequency	No.	Frequency
1	67.0	15	110.9	29	179.9	43	196.6
2	71.9	16	114.8	30	186.2	44	199.5
3	74.4	17	118.8	31	192.8	45	206.5
4	77.0	18	123.0	32	203.5	46	229.1
5	79.7	19	127.3	33	210.7	47	254.1
6	82.5	20	131.8	34	218.1	48	165.5
7	85.4	21	136.5	35	225.7	49	171.3
8	88.5	22	141.3	36	233.6	50	177.3
9	91.5	23	146.2	37	241.8	51	60.7
10	94.8	24	151.4	38	250.3	52	62.5
11	97.4	25	156.7	39	69.3	53	64.7
12	100.0	26	162.2	40	159.8		
13	103.5	27	167.9	41	183.5		
14	107.2	28	173.8	42	189.9		

DCS Code
A list of standard DCS tone codes are shown below.

No.	DCS Code	No.	DCS Code	No.	DCS Code	No.	DCS Code
1	023	27	165	53	413	79	731
2	025	28	172	54	423	80	732
3	026	29	174	55	431	81	734
4	031	30	205	56	432	82	743
5	032	31	223	57	445	83	754
6	043	32	226	58	464	84	036
7	047	33	243	59	465	85	053
8	051	34	244	60	466	86	122
9	054	35	245	61	503	87	122
10	065	36	251	62	506	88	212
11	071	37	261	63	516	89	225
12	072	38	263	64	532	90	246
13	073	39	265	65	546	91	252
14	074	40	271	66	565	92	255
15	114	41	306	67	606	93	266
16	115	42	311	68	612	94	274
17	116	43	315	69	624	95	325
18	125	44	331	70	627	96	332
19	131	45	343	71	631	97	356
20	132	46	346	72	632	98	446
21	134	47	351	73	654	99	452
22	143	48	364	74	662	100	454
23	152	49	365	75	664	101	455
24	155	50	371	76	703	102	462
25	156	51	411	77	712	103	523
26	162	52	412	78	723	104	526

2-Tone Function

The radio decodes the received 2-Tone before receiving the transmission voice when current channel is activated for 2-Tone. Contact your Authorized Maxon Dealer for further information on 2-Tone and its operation.

a.   2-Tone can only be made active on a channel designated to be a 2-Tone channel.

b.   2-Tone is enabled by a short press of the red button. This will mute the receiver until 2-Tone is received.

c.   When the radio decodes a 2-Tone call, there is a ring-type alert for approximately 1 second. This is repeated every 10 seconds until it is turned off.

d.   To turn off the ring alert, press and release the monitor button.

e.   PTT will unmute the receiver if it is in the 2-Tone mode.

VOX

The VOX function is set up by programming of the radio. VOX can be enabled to transmit without pressing the PTT key when the voice signal is transmitted through the microphone of the radio.

Compander

When voice compander is enabled, it transmits compressed audio when transmitting and expands the compressed voice when receiving, both of which improve the communication audio. When the compander function is activated at power on, the green LED is illuminated. After the alert "beep" sound the green LED is turned off. Contact your Authorized Maxon Dealer for further information on voice compander and its operation.

Scramble

The scrambler function is used to protect your voice transmission from being heard by other radios on the same frequency. The scrambler function can be activated by pressing the button that is programmed in the radio. If the red LED flashes once at powering up the radio, the scrambler function is enabled on that channel. After the alert "BEEP" sound the red LED is turned off. When the power is turned off and on, this function is maintained. Contact your Authorized Maxon Dealer for further information on voice scramble and its operation.

Stun / Revive Function

It is possible to stun and revive the radio remotely with Stun ID. If the radio receives Stun ID then all of the key and buttons of the radio will not work and the red and green LED will blink periodically. In this state, pressing the PTT button will activate an alert sound. Although the power is turned off and on, this status is maintained. If the radio receives Revive ID from another radio, the radio returns back to the original mode and an alert "beep" will sound. Contact your Authorized Maxon Dealer for further information on Stun / Revive and its operation.

Busy Channel Lock (BCL)/Busy Channel Lock Override (BCLO)

BCL/BCLO function is used to not interrupt the other users who are using the same frequency. If BCL/BCLO is activated then transmitting is prohibited from the same channel that is being used by others. In this case, an alert sound is heard.

BCL: Prohibit transmission from the same frequency.

BCLO: Prohibit transmission in case of different sub-tone.

Contact your Authorized Maxon Dealer for further information on BCL/BCLO and its operation.

Time Out Timer (TOT)

The TOT function is used to prevent from using one channel continuously for a designated amount of time. If the radio transmits over the TOT time continuously, the transmitting is automatically ceased and an alert sound is generated. Contact your Authorized Maxon Dealer for further information on TOT and its operation.

Key Lock

Key Lock prohibits the use of buttons and channel selector switch when activated and can only be implemented when pressing the pre-assigned button in standby mode. PTT and monitor function are always enabled and cannot be disabled with Key Lock. Key Lock function is deactivated by pressing the pre-assigned button once more. Contact your Authorized Maxon Dealer for further information on Key Lock and its operation.

Battery Indication

This allows the user to check the status of the battery when the radio is in standby mode. The pre-assigned color of LED is illuminated for one second as follows:

- ■ Green color: Fully charged
- ■ Yellow color: Sufficient charge
- ■ Red color: Requires charging

Power Save Control (PSC)

Battery lifetime can be increased when the PSC function is activated. Contact your Authorized Maxon Dealer for further information on PSC and its operation.

Squelch Level

Squelch can be set to different levels via programming. Contact your Authorized Maxon Dealer for further information on Squelch Level and its operation.

Cloning

The radio personality data, such as frequency/tone/scan, can be copied to another radio directly using the cloning function. Contact your Authorized Maxon Dealer for further information on Cloning and its operation.

For Safe Operation

Warning Don't transmit with antenna detached from the radio or don't damage or change antenna type. Strong electronic waves are emitted from the radio and damages or changes to the antenna may effect the performance of the radio, and it may cause the radio to be defective and not covered under warranty.

Warning Don't use other manufacturers accessories. Unknown or unauthorized accessories may cause the radio to be defective and not covered under warranty.

Warning Don't disassemble the radio. Disassembly of the radio may cause a serious defect or malfunction and not be covered under warranty.

Warning Avoid excessive shock to the radio.
Don't place the radio where the direct sunlight or high temperature occurs.
Don't damage the battery pack by sharp object or an execssive shock.

Warning Turn off the radio before boarding on an airplane.
Don't use the radio in the hospital without any pre-approval.
Don't use the radio at the place of where computer of other electronic devices are being used.

Warning
• Please keep the radio at least 1 inch away from the human body.
• Any damage to antenna, may cause RF exposure.
• When using earphone, please reduce the volume to a low level. If not, unexpected high sound may cause harmful effect to your ear.
• Don't touch the conductive metal of the battery radio with wet hands. It may cause damage on your hands.
• Be careful when putting the battery in a pocket or a bag to avoid contact with metal.

• **FCC RF EXPOSURE COMPLIANCE REQUIREMENTS FOR OCCUPATIONAL USE ONLY**
The Federal Communications Commission (FCC), with its action in General Docket 93-62, November 7, 1997, has adopted a safety standard for human exposure to Radio Frequency (RF) electromagnetic energy emitted by FCC regulated equipment. Proper operation of this radio will result in user exposure far below the Occupational Safety and Health Act (OSHA) and Federal Communications Commission limits.

• **DO NOT** transmit for more than 50% of total radio use time (50% duty cycle). Transmitting more than 50% of the time can cause FCC RF exposure compliance requirements to be exceeded.

• This radio is NOT approved for use by the general population in an uncontrolled environment. This radio is restricted to occupational use, work related operations only where radio operator must have the knowledge to control the user's exposure conditions for satisfying the higher exposure limit allowed for occupational use.

• When transmitting, hold the radio in a vertical position with its microphone 1 inches (2.5 cm) away from your mouth.

• The radio is transmitting when the red LED on the front of the radio is illuminated. You can cause the radio to transmit by pressing the PTT bar on the radio

• These are required operating configurations for meeting FCC RF exposure compliance. Failure to observe these restrictions mean violation.

FCC Notice
This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This devices may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

• **English Warning Statement:**
"This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device."

• **French Warning Statement:**
"Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

Warranty Statement

Maxon America, Inc. offers to the original end user:

Three (3) Year Limited Warranty on Maxon TP-5000 Series Radios (separate warranty period on battery and accessories).

One (1) Year Limited Warranty on Accessories (Includes, but not limited to, batteries, antennas, belt clips, chargers, audio accessories, nylon cases, leather cases, etc.)

Maxon warrants each new radio product manufactured or supplied by it to be free from defects in material and workmanship under normal use and service for the time period stated, provided that the user has complied with the requirements stated herein. The warranty period begins on the date of purchase from an Authorized Maxon Dealer. This warranty is not assignable or transferable. This warranty is void if the product serial number is altered, defaced or removed. Maxon is not responsible for any equipment that is attached to or used in conjunction with our products.

During the warranty period, if the product fails to function under normal use, because of manufacturing defects or workmanship, it should be returned to the Authorized Maxon Dealer from which it was purchased. The Authorized Maxon Dealer will repair the product or return the product for repair to Maxon or its Authorized Repair Depot. The user is responsible for the removal of the product from a vehicle or any equipment attached to it, or other site of its use; transportation of the product to the Authorized Maxon Dealer; for the return of the repaired or replacement product to the site of its use and for the reinstallation of the product.

Maxon shall have no obligation to make repairs or replacement of product which results from normal wear and tear, or is necessitated by catastrophe, fault, or negligence of the user, improper or unauthorized alterations or repairs to the product, incorrect wiring, use for which it was not designed or by causes external to the product. Maxon's sole obligation shall be to replace or repair the product covered by the warranty. Replacement is done at Maxon's discretion and may consist of a similar or higher featured product. Repair may include the replacement of parts with functionally equivalent new or reconditioned parts. All replaced parts and accessories are warranted for the balance of the original time period. All parts and accessories that are replaced become the property of Maxon America, Inc.

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