



MAC TACTICAL
RADIOS

DEALER CATALOGUE

TACTICAL PRODUCTS



- VHF-90M Transceivers
- HF-90M Transceivers
- Frequency Hopping
- Encryption Options
- Manpack Packages
- Vehicle Packages
- Base Station Packages
- NVIS Antenna Systems
- Antenna Tuning Units
- Whip, Broadband & Long Wire Antenna Systems
- Data Products
- Power Supplies & Chargers
- Programming Software
- Dealer Support

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CONFIDENTIAL



Q-MAC ELECTRONICS

CONFIDENTIAL DEALER CATALOGUE

**INTERNATIONAL TACTICAL RADIO
PRODUCTS CATALOGUE**

Effective Date: April 2006
Version 7.0A

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1 IMPORTANT NOTES

End User Declaration

- Defence radios designated for defence use are a restricted and controlled export from Australia.
- All products from this catalogue require a signed End User Declaration prior to supply.
- For more information, please see www.defence.gov.au/strategy/dtcc.
- Orders without an accompanying End User Declaration cannot be accepted by Q-MAC Electronics.

List Prices

- The prices listed in the Q-MAC Dealer Price List (given as "List Prices") are recommended End User Prices.
- All prices given in the Dealer Price List are in Australian Dollars and do not include Australian GST.
- All prices given in the Dealer Price List are Ex-Works Perth, Western Australia. Quotations for freight, insurance and documentation may be provided upon request. Such quotations will vary from time to time in accordance with current freight /insurance charges.
- Q-MAC reserves the right to alter prices without notice.

Product Descriptions

- All product descriptions and specifications provided herein are subject to change without notice.

Product Images

- All product images are included as a guide only and may not represent actual product described.

Listed Weights

- Weights listed herein are approximate and include packaging. They are intended as a guide only so that Customers may estimate freight costs.
- When calculating the overall weight of a consignment, Customers should also allow for boxes/cartons that may be used to consolidate goods.

Modes of Delivery

- Q-MAC utilises Incoterms 2000 (as per Section 7) to describe modes of delivery. Where terminology on purchase orders differs from Incoterms 2000, Q-MAC reserves the right to utilise the nearest matching mode of transport listed in Section 7, International Freight Information.

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Q-MAC Bank Details for Telegraphic Transfers:

Account Name:	Q-MAC ELECTRONICS PTY LTD
Account Number:	306 089 1902685
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Swift Code For Rapid Transfers:	BKWAAU6P

2 CONFIGURING Q-MAC PACKAGES

Q-MAC encourages the use of this checklist to ensure end users consider all aspects of their application. This is especially relevant for field deployment where missing items will cause significant inconvenience.



3 VHF PRODUCTS

3.1 VHF-90M LOW BAND VHF TRANSCEIVER



Tactical VHF Radio

VHF-90M

30 - 88 MHz

Voice Encryption

Frequency Hopping

Secure, Simple to Use and Versatile

The VHF-90M military transceiver is a state of the art communication device specifically designed for tactical military applications. It is an extremely compact and light weight unit, featuring only essential controls to ensure ease of operation. The VHF-90M can be worn on the user's back in a Manpack configuration or on the front in a Squad radio configuration.

The radio is available with five modes of communication:

- Analog Fixed Frequency (F3E Stanag 4204 ANPRC 77 Compatible)
- Secure Digital Fixed Frequency
- Secure Digital Frequency Hopping
- Secure Digital Free Channel Search (FCS)
- Digital Data Transmission



Designed for Tactical Use

The VHF-90M addresses two roles. When used with a short antenna, it is an ideal squad or platoon level communicator which is light weight and simple to operate. When fitted with a full length tactical whip antenna, the VHF-90M can be operated at company, battalion or brigade level where longer ranges are required.

In both roles, the ECCM capability ensures a low probability of intercept. The dual role capability simplifies equipment logistics and renders the VHF-90M as a capable replacement of the PRC-77 and equivalents.

The VHF-90M has a simple user interface which provides infantrymen with sure and dependable communication in tactical conditions. Only essential controls are included on the front panel for fast and simple operation in battlefield conditions. Advanced programming functionality is available in sub-menus. The VHF-90M can be either field or PC programmed.

The VHF-90M is solidly constructed and is designed to withstand rigorous military use. Emphasis in the design of the VHF-90M has been placed on value engineering to ensure low cost of ownership over a long service life. This is achieved by utilising SMD components from generic multi-sourced families.

In short, this revolutionary new transceiver incorporates the very latest in RF and DSP design technology. The VHF-90M is the most cost effective, compact, versatile, high performance VHF transceiver available in the tactical military market today.



Features

- Manpack Performance in Holster Size
- ECCM Capability
- Data Transmission
- Low Cost
- Light Weight - 1kg complete with battery
- Immersible, Vibration & Temperature rated to Military Standards
- 5 Watt Portable
- 50 Watt Vehicle/Base
- 2320 Channels
- 10 Programmable Channels
- Selective, Group & Broadcast Calling
- Low Current Consumption
- 8000 Hours MTBF



3.2 MANPORTABLE PACKAGES

3.2.1 MX9700 VHF-90M Manportable Package

5W LIGHT WEIGHT MANPORTABLE PACKAGE FOR TACTICAL USE

The MX9700 Manportable Package is ideal for squad and brigade level communications. Simply changing antenna types can provide the necessary range between the different modes of operation. The secure modes option, which includes Frequency Hopping, Digital Encryption and Free Channel Search (FCS), provides secure, jam-resistant VHF communications.

Includes:

- VHF-90M Transceiver
- QM4716 Standard Military Telephone Handset (no keypad)
- 1m Tape Whip Antenna
- Short Rubber Whip Antenna
- Rechargeable 2.4Ah NiMH Battery Pack
- Canvas Shoulder Holster



MX9700 MANPORTABLE ORDERING INFORMATION

Stock Code	Description	Weight
MX9700	Standard VHF-90M Manportable	2.50kg

Encryption & Frequency Hopping Options/Upgrades

QM9761	Secure Modes Option, includes Frequency Hopping, Encryption and Free Channel Search (FCS) (requires QM9751 Advanced Option 1)	0.05kg
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NOTE: The Secure Modes Option is subject to Australian Defence Export Controls and a signed End User Declaration must be provided for supply of this option. For more information see www.defence.gov.au/strategy/dtcc.

Recommended Options/Upgrades

QM9751	Advanced Option 1 Software and Tactical Telephone Handset with keypad - required for Selcall functionality	0.20kg
QM9755	Data Option - Enables transmission of data between VHF-90M transceivers	0.05kg
QM9756	VHF-90M Data Application - Provides SMS, Chat, File Transfer Software for Pocket PC/Windows PC Platform; Requires the QM9755 Data Transmission Option and either the QM5700M Serial Cable or QM4775M Bluetooth link to the VHF-90M	0.05kg
QM7303	8 Section 3m Whip Antenna	0.30kg
QM8700M	12v 2.4Ah NiMH Rechargeable Battery	0.50kg
QM4775M	Bluetooth Upgrade Option for VHF-90M (added to a QM8700M battery)	0.50kg
QM8007M	AC Mains Charger - Dual Battery Charger. Specify Plug Type (see Section 3.8.7.1)	1.30kg
QM5007M	DC Cable for Battery Charge Controller - Charges batteries from DC source	1.00kg

These options are the most commonly ordered options and recommended by Q-MAC to provide a comprehensive solution for most Manportable applications.

Miscellaneous Options/Accessories

QM8021M	Solar Panel Charger (also requires QM8375M Dual Battery Adaptor, see 3.7.8)	1.30kg
QM8035M	Hand Crank Generator (also requires QM8375M Dual Battery Adaptor, see 3.7.8)	2.70kg
QM8735M	Dual Battery Adaptor for Solar and Hand Crank Battery Chargers	0.50kg
QM4743	VHF-90M Headset - Light weight under helmet tactical headset with PTT and clip *	1.00kg
QM4744	VHF-90M Headset - Military grade; single ear operation with boom microphone *	1.00kg
QM1007M	VHF-90M Programming Software and Cable	1.00kg
QM5700M	VHF-90M Serial Cable - Used for programming and data transmission (D9 and D25)	0.50kg
QM5701M	VHF-90M Cloning Cable - Allows cloning of channel settings between VHF-90Ms	0.50kg

* Other Headset options are available on request.

3.3 VEHICLE PACKAGES

3.3.1 MX9715 VHF-90M 50W Vehicle Package

50W VEHICLE PACKAGE FOR TRACKED AND WHEELED TACTICAL VEHICLES

The MX9715 Vehicle Package is ideal for brigade level communications. It includes the VDS-90M docking station for the VHF-90M allowing jerk and run dismounted use of transceiver. A 50W booster amplifier and tactical vehicle antenna system provide extended coverage. The secure modes option (i.e. Frequency Hopping, Digital Encryption and Free Channel Search) provides secure, jam-resistant VHF communications.



Includes:

- VHF-90M Transceiver
- QM4716 Standard Military Telephone Handset (no keypad)
- 1.9m Military Vehicle Whip System (includes antenna elements and antenna base)
- VDS-90M VHF Docking Station for docking of VHF-90M Transceiver
- VHF-50M 50W VHF Booster Amplifier
- 3m Interconnecting Control Cable between VHF-50M Amplifier and VDS-90M
- DC Power Cable to VHF-50M 4.5m with 20A Fuse
- Coax Cable 3m VDS-90M to VHF-50M
- Coax Cable 4.5m VHF-90M to Antenna



MX9715 50 WATT VEHICLE PACKAGE ORDERING INFORMATION

Stock Code	Description	Weight
MX9715	VHF-90M 50 Watt Vehicle Package	10.00kg

Encryption & Frequency Hopping Options/Upgrades

QM9761	Secure Modes Option - Includes Frequency Hopping, Encryption and Free Channel Search (FCS); Requires QM9751 Advanced Option 1	0.05kg
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NOTE: The Secure Modes Option is subject to Australian Defence Export Controls and a signed End User Declaration must be provided for supply of this option. For more information see www.defence.gov.au/strategy/dtcc.

Recommended Options/Upgrades

QM9751	Advanced Option 1 - Software and Tactical Telephone Handset with keypad; required for Selcall functionality	0.20kg
QM9755	Data Option - Enables transmission of data between VHF-90M transceivers	0.05kg
QM9756	VHF-90M Data Application - Provides SMS, Chat, File Transfer Software for Pocket PC/Windows PC Platform; Requires the QM9755 Data Transmission Option and either the QM5700M Serial Cable or QM4775M Bluetooth link to the VHF-90M	0.05kg
QM4775MV	Bluetooth Upgrade Option for VHF-90M (added to the VDS Unit)	0.50kg

These options are the most commonly ordered options and recommended by Q-MAC to provide a comprehensive solution for most Vehicle applications.

Miscellaneous Options/Accessories

QM4743	VHF-90M Headset - Light weight under helmet tactical headset with PTT and clip *	1.00kg
QM4744	VHF-90M Headset - Military grade; single ear operation with boom microphone *	1.00kg
QM4723M	Rugged External Mount Speaker	1.00kg
MX9700R	VHF-90M Manportable Package - Front mounting minus transceiver	2.50kg
QM1007M	VHF-90M Programming Software and Cable	1.00kg
QM5700M	VHF-90M Serial Cable - Used for programming and data transmission (D9 and D25)	0.50kg
QM5701M	VHF-90M Cloning Cable - Allows cloning of channel settings between VHF-90Ms	0.50kg
QM7174M	Replacement Spare Antenna Elements	2.00kg

* Other Headset options are available on request.

3.3.2 MX9716 VHF-90M 5W Vehicle Package

5W VEHICLE PACKAGE FOR TRACKED AND WHEELED TACTICAL VEHICLES

The MX9716 Vehicle Package is ideal for brigade level communications. It includes the VDS-90M docking station for the VHF-90M allowing jerk and run dismounted use of transceiver. The secure modes option (i.e. Frequency Hopping, Digital Encryption and Free Channel Search) provides secure, jam-resistant VHF communications.



Includes:

- VHF-90M Transceiver
- QM4716 Standard Military Telephone Handset (no keypad)
- 1.9m Military Vehicle Whip System (includes antenna elements and antenna base)
- VDS-90M Vehicle Appliqué Unit for docking of VHF-90M Transceiver
- DC Power Cable to VDS-90M 4.5m with 20A Fuse and Aux connector
- Coax Cable 4.5m VHF-90M to Antenna



QM9015 VEHICLE PACKAGE ORDERING INFORMATION

Stock Code	Description	Weight
MX9716	VHF-90M 5 Watt Vehicle Package	7.00kg

Encryption & Frequency Hopping Options/Upgrades

QM9761	Secure Modes Option - Includes Frequency Hopping, Encryption and Free Channel Search (FCS); Requires QM9751 Advanced Option 1	0.05kg
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NOTE: The Secure Modes Option is subject to Australian Defence Export Controls and a signed End User Declaration must be provided for supply of this option. For more information see www.defence.gov.au/strategy/dtcc.

Recommended Options/Upgrades

QM9751	Advanced Option 1 - Software and tactical telephone handset with keypad; Required for Selcall functionality	0.20kg
QM9755	Data Option - Enables transmission of data between VHF-90M transceivers	0.05kg
QM9756	VHF-90M Data Application - Provides SMS, Chat, File Transfer Software for Pocket PC/Windows PC Platform; Requires the QM9755 Data Transmission Option and either the QM5700M Serial Cable or QM4775M Bluetooth link to the VHF-90M	0.05kg
QM4775MV	Bluetooth Upgrade Option for VHF-90M (added to the VDS Unit)	0.50kg

These options are the most commonly ordered options and recommended by Q-MAC to provide a comprehensive solution for most Vehicle applications.

Miscellaneous Options/Accessories/Spares

QM4743	VHF-90M Headset - Light weight under helmet tactical headset with PTT and clip *	1.00kg
QM4744	VHF-90M Headset - Military grade; single ear operation with boom microphone *	1.00kg
QM4723M	Rugged External Mount Speaker	1.00kg
QM1007M	VHF-90M Programming Software and Cable	1.00kg
QM5700M	VHF-90M Serial Cable - Used for programming and data transmission (D9 and D25)	0.50kg
QM5701M	VHF-90M Cloning Cable - Allows cloning of channel settings between VHF-90Ms	0.50kg
QM7174M	Replacement Spare Antenna Elements	2.00kg
MX9700R	MX9700 Manportable transceiver package minus the transceiver for jerk and run operation	2.50kg
QM9705M	VHF-50M 50 Watt Booster Amplifier (refer to 3.8.4 DC Power Cables and 3.8.5 Coaxial Cables for additional cables require to complete the system)	5.00kg

* Other headset options are available on request.

3.4 BASE STATION PACKAGES

3.4.1 MX9720 VHF-90M 50W Base Station Package

50W BASE STATION PACKAGE FOR FIELD AND FIXED BASE USE

The MX9720 Base Station Package is ideal for both fixed and field base station applications. It includes the VDS-90M docking station for the VHF-90M transceiver which allows jerk and run dismounted use of transceiver. A 50 Watt booster amplifier and Discone VHF antenna provide extended coverage. The secure modes option (i.e. Frequency Hopping, Digital Encryption and Free Channel Search) provides secure, jam-resistant VHF communications.

Includes:

- VHF-90M Transceiver
- QM4716 Standard Military Telephone Handset (no keypad)
- Discone Antenna System
- VDS-90M Vehicle Docking Station for the VHF-90M Transceiver
- VHF-50M 50 Watt VHF Booster Amplifier
- AC Main Power Supply with Power Cable (Specify AC Cable type)
- Coax Cable 30m to Antenna



MX9720 BASE STATION PACKAGE ORDERING INFORMATION

Stock Code	Description	Weight
MX9720	VHF-90M 50 Watt Base Station Package	20.00kg
NOTE:	Please also order an IEC mains cable to suit your region. Refer to Section 3.8.7.2 for details. One cable is included in the price of the MX9720.	0.05kg

Encryption & Frequency Hopping Options/Upgrades

QM9761	Secure Modes Option - Includes Frequency Hopping, Encryption and Free Channel Search (FCS); Requires QM9751 Advanced Option 1	0.05kg
NOTE:	The Secure Modes Option is subject to Australian Defence Export Controls and a signed End User Declaration must be provided for supply of this option. For more information see www.defence.gov.au/strategy/dtcc .	

Recommended Options/Upgrades

QM9751	Advanced Option 1 - Software and tactical telephone handset with keypad; Required for Selcall functionality	0.20kg
QM9755	Data Option - Enables transmission of data between VHF-90M transceivers	0.05kg
QM9756	VHF-90M Data Application - Provides SMS, Chat, File Transfer Software for Pocket PC/Windows PC Platform; Requires the QM9755 Data Transmission Option and either the QM5700M Serial Cable or QM4775M Bluetooth link to the VHF-90M	0.05kg
QM4775MV	Bluetooth Upgrade Option for VHF-90M (added to the VDS Unit)	0.50kg

These options are the most commonly ordered options and recommended by Q-MAC to provide a comprehensive solution for most Base Station applications.

Miscellaneous Options/Accessories

QM4743	VHF-90M Headset - Light weight under helmet tactical headset with PTT and clip *	1.00kg
QM4744	VHF-90M Headset - Military grade; single ear operation with boom microphone *	1.00kg
QM4723M	Rugged External Mount Speaker	1.00kg
QM1007M	VHF-90M Programming Software and Cable	1.00kg
QM5700M	VHF-90M Serial Cable - Used for programming and data transmission (D9 and D25)	0.50kg
QM5701M	VHF-90M Cloning Cable - Allows cloning of channel settings between VHF-90Ms	0.50kg
MX9700R	MX9700 Manportable transceiver package minus the transceiver for jerk and run operation	2.50kg

* Other headset options are available on request.

3.5 VHF-90M TRANSCEIVER STANDALONE & OPTIONS

3.5.1 QM9700 VHF-90M Transceiver (Military Grade)

SPARE TRANSCEIVER TO MAKE UP ADDITIONAL PACKAGES

Includes:

- 30-88MHz MHz Frequency Coverage
- 5 Watt Power Output
- 150Hz Squelch System (Stanag 4204, PRC-77 compatible)
- 2320 Channels
- 10 Programmable Channels
- Rx Signal Strength Indicator
- Erase Facility
- Selective and Group Calling
- VHF-90M Operation and Installation Guide



ORDERING INFORMATION

Stock Code	Description	Weight
QM9700	Standard VHF-90M	1.00kg

Encryption & Frequency Hopping Options/Upgrades

QM9761	Secure Modes Option - Includes Frequency Hopping, Encryption and Free Channel Search (FCS); Requires QM9751 Advanced Option 1	0.05kg
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NOTE: The Secure Modes Option is subject to Australian Defence Export Controls and a signed End User Declaration must be provided for supply of this option. For more information see www.defence.gov.au/strategy/dtcc.

Recommended Options/Upgrades

QM4716	VHF-90M Telephone Handset	0.45kg
QM4717	VHF-90M Telephone Handset with Numeric Keypad	0.45kg
QM9755	Data Option - Enables transmission of data between VHF-90M transceivers	0.05kg
QM9756	VHF-90M Data Application - Provides SMS, Chat, File Transfer Software for Pocket PC/Windows PC Platform; Requires the QM9755 Data Transmission Option and either the QM5700M Serial Cable or QM4775M Bluetooth link to the VHF-90M	0.05kg
QM7303	8 Section 3m Whip Antenna	0.30kg
QM7307M	Short Rubber Whip Antenna	0.50kg
QM7305	Tape Whip Antenna	0.20kg
QM8700M	12v 2.4Ah NiMH Rechargeable Battery	0.50kg
QM4775M	Bluetooth Upgrade Option for VHF-90M (added to a QM8700M battery)	0.50kg
QM8007M	AC Mains Charger - Dual Battery Charger; Specify Plug Type (see Section 3.8.7.1)	1.30kg
QM5007M	DC Cable for Battery Charge Controller - Charges batteries from DC source	1.00kg

Miscellaneous Options/Accessories

QM8021M	Solar Panel Charger - Requires QM8375M Dual Battery Adaptor (see 3.7.8)	1.30kg
QM8035M	Hand Crank Generator - Requires QM8375M Dual Battery Adaptor (see 3.7.8)	2.70kg
QM8735M	Dual Battery Adaptor for Solar and Hand Crank Battery Chargers	0.50kg
QM4743	VHF-90M Headset - Light weight under helmet tactical headset with PTT and clip *	1.00kg
QM4744	VHF-90M Headset - Military grade; single ear operation with boom microphone *	1.00kg
QM1007M	VHF-90M Programming Software and Cable	1.00kg
QM5008M	VHF-90M Tactical Field Rebro Cable - Enables back to back radio rebro operation	2.00kg
QM5700M	VHF-90M Serial Cable - Used for programming and data transmission (D9 and D25)	0.50kg
QM5701M	VHF-90M Cloning Cable - Allows cloning of channel settings between VHF-90Ms	0.50kg

* Other Headset options are available on request.

3.6 ANTENNA SYSTEMS

3.6.1 QM7307 Short Rubber Whip Antenna

Description:

Short Rubberised Whip Antenna for use in close range Squad level communications. (600mm)



ORDERING INFORMATION

Stock Code	Description	Weight
QM7307M	Short Rubber Whip Antenna	0.50kg

3.6.2 QM7303 Collapsible Whip Antenna (8-section)

Description:

High efficiency collapsible eight-section whip antenna (3m), as supplied with the MX9700 VHF-90M Manportable Package. The collapsed length is 390mm.



ORDERING INFORMATION

Stock Code	Description	Weight
QM7303	Tape Whip Antenna	0.30kg

3.6.3 QM7305 Tape Whip Antenna

Description:

Tape Whip Antenna: 1.1m flexible whip antenna supplied with gooseneck. Suited for use in jungle or forestry areas. As supplied with the MX9700 VHF-90M Manportable Package.



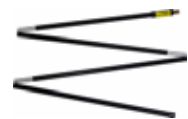
ORDERING INFORMATION

Stock Code	Description	Weight
QM7305	Tape Whip Antenna	0.20kg

3.6.4 QM7304 Collapsible Whip Antenna (4-section)

Description:

Collapsible four section whip antenna (1m), complete with flexible goose neck. Collapsed length: 335mm. Suited for the MX9700 VHF-90M Manportable Package.



ORDERING INFORMATION

Stock Code	Description	Weight
QM7304	Collapsible Whip Antenna (4-section)	0.20kg

3.6.5 QM7171M Vehicle Whip Antenna System

Description:

VHF 30-88MHz Broadband Military Whip Antenna Systems. Comprises 2 Section Whip antenna (total length = 2.72m) and US/NATO Standard Antenna Base with BNC Connector.



ORDERING INFORMATION

Stock Code	Description	Weight
QM7171M	VHF-90M Vehicle Whip Antenna System - Antenna and base	6.00kg
QM7172M	VHF-90M Vehicle Antenna Base Only - No antenna	3.00kg
QM7174M	VHF-90M Vehicle Whip Antenna - Replacement elements only	2.00kg

3.6.6 QM7702M 30-88MHz Base Station Discone Antenna

Description:

The Discone antenna is designed for based station or tactical field base station use. Its flexible design and omni-directional characteristic make it suitable for short to medium range voice and data communications. Its broadband design makes it compatible with Frequency Hopping. The unit is supplied with 30 metres RG-58 coaxial cable with connectors and mounting pole. It does not include masts or mounting brackets.



ORDERING INFORMATION

Stock Code **Description**

Weight

QM7702M 30-88MHz Base Station Discone Antenna

5.00kg

Other antenna types are available on application.

3.7 POWER SUPPLIES, CHARGERS & BATTERIES

3.7.1 QM8725M VHF-90M Dual Battery Charge Controller

Description:

Intelligent Dual Battery Charge Controller. Can be used with AC or DC inputs from 10-30V. Charges 2 x 2.4Ah Nickel Metal Hydride Rechargeable Batteries individually or simultaneously.



ORDERING INFORMATION

Stock Code **Description**

Weight

QM8725M VHF-90M Dual Battery Charge Controller

1.00kg

3.7.2 QM8007M VHF-90M Dual Battery Charge Controller and AC Mains Adaptor

Description:

Intelligent Dual Battery Charge Controller supplied with 110-250AC In and 24DC Out Mains Adaptor. Charges 2 x 2.4Ah Nickel Metal Hydride Rechargeable Batteries individually or simultaneously.



ORDERING INFORMATION

Stock Code **Description**

Weight

QM8007M VHF-90M Dual Battery Charge Controller and AC Mains Adaptor

1.30kg

NOTE: Please also order a Figure 8 mains cable to suit your region. Refer to Section 3.8.7.1 for details. One cable is included in the price of the QM8007M.

0.05kg

3.7.3 QM8723M AC Mains Adaptor to suit QM8725M Charge Controller

Description:

110-250AC In and 24DC Out Mains Adaptor to suit QM8725M VHF-90M Charge Controller (see 3.7.1).



ORDERING INFORMATION

Stock Code	Description	Weight
QM8723M	Mains Adaptor - Suits QM8725M Charge Controller (see 3.7.1)	1.00kg
NOTE:	Please also order a Figure 8 mains cable to suit your region. Refer to Section 3.8.7.1 for details. One cable is included in the price of the QM8723M.	0.05kg

3.7.4 QM8700M VHF-90M 2.4Ah NiMH Battery Pack

Description:

2.4Ah Nickel Metal Hydride Rechargeable Battery. Suits VHF-90M Transceiver (see 3.5.1).



ORDERING INFORMATION

Stock Code	Description	Weight
QM8700M	VHF-90M 2.4Ah NiMH Battery Pack	0.50kg

3.7.5 QM5007M Vehicle DC Cable to suit QM8725M Charge Controller

Description:

DC power cable for VHF-90M Charge Controller. 3m cable with Mating Connector for Charge Controller and Cigarette Lighter Adaptor at the other end.



ORDERING INFORMATION

Stock Code	Description	Weight
QM5007M	Vehicle DC Cable - Suits QM8725M charge controller (see 3.7.1)	1.00kg

3.7.6 QM8021M Fold-up Solar Panel Charger

Description:

Solar Panel Charger - 10.8 Watt rated power, complete with extension cable and mating connector to suit military grade packages. Comprises five panels, which fold into a compact canvas pouch. Standard colour is black.

Note: The QM8021M Fold-up Solar Panel Charger requires a QM8735M Dual Battery Adaptor (refer section 3.7.8) to allow charging of VHF-90M batteries.



ORDERING INFORMATION

Stock Code	Description	Weight
QM8021M	Fold-up Solar Panel Charger	1.30kg

3.6.6 QM7702M 30-88MHz Base Station Discone Antenna

Description:

The Discone antenna is designed for based station or tactical field base station use. Its flexible design and omni-directional characteristic make it suitable for short to medium range voice and data communications. Its broadband design makes it compatible with Frequency Hopping. The unit is supplied with 30 metres RG-58 coaxial cable with connectors and mounting pole. It does not include masts or mounting brackets.



ORDERING INFORMATION

Stock Code **Description**

Weight

QM7702M 30-88MHz Base Station Discone Antenna

5.00kg

Other antenna types are available on application.

3.7 POWER SUPPLIES, CHARGERS & BATTERIES

3.7.1 QM8725M VHF-90M Dual Battery Charge Controller

Description:

Intelligent Dual Battery Charge Controller. Can be used with AC or DC inputs from 10-30V. Charges 2 x 2.4Ah Nickel Metal Hydride Rechargeable Batteries individually or simultaneously.



ORDERING INFORMATION

Stock Code **Description**

Weight

QM8725M VHF-90M Dual Battery Charge Controller

1.00kg

3.7.2 QM8007M VHF-90M Dual Battery Charge Controller and AC Mains Adaptor

Description:

Intelligent Dual Battery Charge Controller supplied with 110-250AC In and 24DC Out Mains Adaptor. Charges 2 x 2.4Ah Nickel Metal Hydride Rechargeable Batteries individually or simultaneously.



ORDERING INFORMATION

Stock Code **Description**

Weight

QM8007M VHF-90M Dual Battery Charge Controller and AC Mains Adaptor

1.30kg

NOTE: Please also order a Figure 8 mains cable to suit your region. Refer to Section 3.8.7.1 for details. One cable is included in the price of the QM8007M.

0.05kg

3 VHF PRODUCTS

3.1 VHF-90M LOW BAND VHF TRANSCEIVER



Tactical VHF Radio

VHF-90M

30 - 88 MHz

Voice Encryption

Frequency Hopping



Secure, Simple to Use and Versatile

The VHF-90M military transceiver is a state of the art communication device specifically designed for tactical military applications. It is an extremely compact and light weight unit, featuring only essential controls to ensure ease of operation. The VHF-90M can be worn on the user's back in a Manpack configuration or on the front in a Squad radio configuration.

The radio is available with five modes of communication:

- Analog Fixed Frequency (F3E Stanag 4204 ANPRC 77 Compatible)
- Secure Digital Fixed Frequency
- Secure Digital Frequency Hopping
- Secure Digital Free Channel Search (FCS)
- Digital Data Transmission

Designed for Tactical Use

The VHF-90M addresses two roles. When used with a short antenna, it is an ideal squad or platoon level communicator which is light weight and simple to operate. When fitted with a full length tactical whip antenna, the VHF-90M can be operated at company, battalion or brigade level where longer ranges are required.

In both roles, the ECCM capability ensures a low probability of intercept. The dual role capability simplifies equipment logistics and renders the VHF-90M as a capable replacement of the PRC-77 and equivalents.

The VHF-90M has a simple user interface which provides infantrymen with sure and dependable communication in tactical conditions. Only essential controls are included on the front panel for fast and simple operation in battlefield conditions. Advanced programming functionality is available in sub-menus. The VHF-90M can be either field or PC programmed.

The VHF-90M is solidly constructed and is designed to withstand rigorous military use. Emphasis in the design of the VHF-90M has been placed on value engineering to ensure low cost of ownership over a long service life. This is achieved by utilising SMD components from generic multi-sourced families.

In short, this revolutionary new transceiver incorporates the very latest in RF and DSP design technology. The VHF-90M is the most cost effective, compact, versatile, high performance VHF transceiver available in the tactical military market today.

Features

- Manpack Performance in Holster Size
- ECCM Capability
- Data Transmission
- Low Cost
- Light Weight - 1kg complete with battery
- Immersible, Vibration & Temperature rated to Military Standards
- 5 Watt Portable
- 50 Watt Vehicle/Base
- 2320 Channels
- 10 Programmable Channels
- Selective, Group & Broadcast Calling
- Low Current Consumption
- 8000 Hours MTBF



3.8.4 DC Power Cables

3.8.4.1 QM5130 VDS-90M → Misc Power Source (4.5m)

Description:

VDS-90M DC Input Power connector at one end, bare ended at the other end. As supplied with the MX9716 5 Watt VHF-90M Vehicle Package. Includes 10Amp HRC fuse.

ORDERING INFORMATION

Stock Code	Description	Weight
QM5130	VDS-90M → Misc Power Source (4.5m)	2.00kg

3.8.4.2 QM5122 VHF-50M → Misc Power Source (4.5m)

Description:

VHF-50M DC Input Power connector at one end, bare ended at the other end. As supplied with the MX9715 50 Watt VHF-90M Vehicle Package. Includes 20Amp HRC fuse.

ORDERING INFORMATION

Stock Code	Description	Weight
QM5122	VHF-50M → Misc Power Source (4.5m)	2.00kg

3.8.4.3 QM5125-2.0M VHF-50M → VDS-90M Control Cable (2m)

Description:

Control Cable to connect VHF-50M to VDS-90M. As supplied with the MX9715 50 Watt VHF-90M Vehicle Package.

ORDERING INFORMATION

Stock Code	Description	Weight
QM5125-2.0M	VHF-50M → VDS-90M Control Cable (3m)	2.00kg

3.8.5 Coaxial Cables

3.8.5.1 QM5107 VDS-90M → Vehicle Antenna (4.5m)

Description:

BNC connectors fitted both ends. As supplied with MX9716 Vehicle Packages.

ORDERING INFORMATION

Stock Code	Description	Weight
QM5107	Coax Cable VDS-50M → Vehicle Antenna (4.5m)	0.25kg

3.8.5.2 QM5126-30M VHF-50M → Base Station Antenna (30m)

Description:

Coax Cable with N Type at one end and BNC connector fitted at the other end. As supplied with MX9720 Base Station Package.

ORDERING INFORMATION

Stock Code	Description	Weight
QM5126-30M	Coax Cable VHF-50M → Base Station Antenna (30m)	2.00kg

3.8.5.3 QM5126-4.5M VHF-50M → Vehicle Antenna (4.5m)

Description:

BNC connectors fitted at both ends. As supplied with MX9715 Vehicle Package.

ORDERING INFORMATION

Stock Code	Description	Weight
QM5126-4.5M	Coaxial VHF-50M → Vehicle Antenna (4.5m)	0.25kg

3.8.6 Other Cables

3.8.6.1 QM5700M VHF-90M Programming Cable

Description:

For use with the QM1007M VHF-90M Programming Package, generic terminal software or data applications. The 2m cable connects between the VHF-90M and an RS232 computer serial port (DB9 connector).

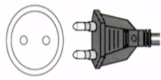
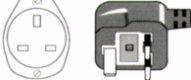
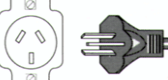
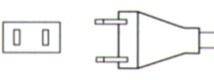


ORDERING INFORMATION

Stock Code	Description	Weight
QM5700M	VHF-90M Programming Cable	0.50kg

3.8.7 Mains Cables

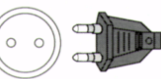
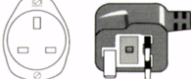
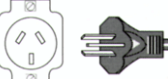



3.8.7.1 Figure 8 Socket Cables

Mains outlets vary across the globe. Summarised below are the most common mains plugs.

Mains End					
Equipment End	Type A: Continental Europe	Type B: United Kingdom	Type C: Australia, New Zealand, Argentina	Type D: North America	Type E: India, South Africa
	Order Code: QM5087 (0.05kg)	Order Code: QM5082 (0.05kg)	Order Code: QM5081 (0.05kg)	Order Code: QM5083 (0.05kg)	Order Code: QM5118 (0.05kg)

3.8.7.2 IEC Socket Cables

Mains outlets vary across the globe. Summarised below are the most common mains plugs.

Mains End					
Equipment End	Type A: Continental Europe	Type B: United Kingdom	Type C: Australia, New Zealand, Argentina	Type D: North America	Type E: India, South Africa
	Order Code: QM5085 (0.05kg)	Order Code: QM5086 (0.05kg)	Order Code: QM5084 (0.05kg)	Order Code: QM5119 (0.05kg)	Order Code: QM5120 (0.05kg)

3.9 DEALER SUPPORT PRODUCTS

3.9.1 Software & Manuals

3.9.1.1 QM1007M VHF-90M Programming Package

A Microsoft Windows compatible (Windows 2000 or XP required) software package which allows the programming of the following functions:

- Channel/frequency programming
- Power output setting
- Field programming enable
- Selcall ID number
- Selcall and Scanning on specific channels/frequencies

Package Includes:

- QM5700M Programming Cable
- Quick Reference Guide: Programming Package
- Software Installation CD



ORDERING INFORMATION

Stock Code	Description	Weight
QM1007M	VHF-90M Programming Package	1.00kg

3.9.1.2 QM1027 VHF-90M Technical Manual

Description:

A detailed manual outlining product specifications, functions, software, maintenance, fault finding and testing.

Note:

Authorised Q-MAC Dealers receive one VHF-90M Technical Manual, at no charge, with their first purchase of the VHF-90M Transceiver. Should they be required, additional copies must be purchased.



ORDERING INFORMATION

Stock Code	Description	Weight
QM1027	VHF-90M Technical Manual	0.35kg

3.9.2 Replacement Modules

3.9.2.1 96050 VHF-90M RF Module

Description:

VHF-90M Radio Frequency Module.



ORDERING INFORMATION

Stock Code	Description	Weight
96050	VHF 90M RF Module	0.30kg

3.9.2.2 96051 VHF-90M Power Amplifier Module

Description:

VHF-90M Power Amplifier Module.



ORDERING INFORMATION

Stock Code	Description	Weight
96051	VHF 90M Power Amplifier Module	0.30kg

3.9.2.3 96052 VHF-90M DSP Module

Description:

VHF-90M Digital Signal Processor Module.

NOTE: If the VHF-90M radio this module is intended for has Secure Modes Option (Frequency Hopping, Encryption and Free Channel Search), export of this module is subject to Australian Defence Export Controls and a signed End User Declaration must be provided for the supply of these options. For more information see www.defence.gov.au/strategy/dtcc.



ORDERING INFORMATION

Stock Code	Description	Weight
96052	VHF 90M DSP Module	0.30kg

3.9.2.4 97753 VHF-90M Front Panel Module

Description:

VHF-90M Front Panel, including front panel PCB and connectors.



ORDERING INFORMATION

Stock Code	Description	Weight
97753	VHF 90M Front Panel Module	0.30kg

3.9.2.5 97754 VHF-90M Front Panel Module

Description:

VHF-90M Front Panel, including front panel PCB and connectors.



ORDERING INFORMATION

Stock Code	Description	Weight
97754	VHF 90M Rear Panel Module	0.30kg

3.9.2.6 QM4772M VHF-90M Desktop Interface Unit

Description:

The VHF-90M Desktop Interface Unit is a desktop box which mates with VHF-90M transceiver and provides breakout cables from rear of VHF-90M transceiver to DC Supply, RS232 for programming and RF via 50Ohm Coax.

ORDERING INFORMATION

Stock Code	Description	Weight
QM4772M	VHF-90M Desktop Interface Unit	1.00kg

4 HF PRODUCTS

4.1 HF-90M FREQUENCY HOPPING SSB HF TRANSCEIVER



HF-90M

2 - 30 MHz

50 Watts PEP

Frequency Hopping

Tactical HF Radio



Secure, Simple to Use and Versatile

The HF-90M is a rugged all-purpose HF SSB transceiver designed for manpack, mobile and base station applications. It is an extremely compact and light weight unit, featuring only essential controls to ensure ease of operation.

The transceiver has a quality, high specification design. It provides full frequency coverage from 2-30 MHz and has capacity for up to 255 programmed channels. The unit can operate at a selected power level of up to 50 Watts, whilst achieving low battery consumption. It is also extremely reliable due to the advanced SMD manufacturing process used and overall design efficiency.

The specifications of the HF-90M enable reliable long-range communications to distances in excess of 3,000km. In addition, the transceiver incorporates superior signal handling capability which ensures excellent reception, even in the most crowded radio environments.

The HF-90M Frequency Hopping Option is an integral module within the HF-90M Transceiver. This option enables secure, jam-resistant HF communications to a military standard. The development of the HF-90M Frequency Hopping Option represents a significant breakthrough in the field of military HF communications. For the first time, end users have access to a product which is affordable, yet offers a very high grade of voice security.

Designed For Tactical Use

Q-MAC Electronics has designed the HF-90M so that it will adapt to multiple configurations. Its compact, light weight size and low battery consumption makes it ideal for manpack applications. With a maximum power output of 50 Watts and full frequency coverage, the HF-90M is also suited to vehicle and base station configurations.

The transceiver is extremely rugged in its construction. The exterior case is made from a tough anodised aluminium extrusion and all connectors and controls are fully protected by the rear heat sink and front panel. The HF-90M is well protected against harsh environments, displaying a high tolerance to extreme temperatures, humidity and dust levels, plus full immersion in water to military standards.

In short, this revolutionary transceiver incorporates the very latest in RF design technology, making the HF-90M the most compact, versatile, high performance HF SSB transceiver available on the tactical HF market today.

Features

- Military Connectors.
- ECCM Capability
- Simple 6 Button & Rotary Control Operation
- Light weight - less than 1 kg
- 50 Watt PEP
- 255 Channels
- Selective, Group & Broadcast Calling
- USB/LSB Operation
- Six Digit LED Display (7-segment)
- 4 Minute MTTR
- 6000 Hour MTBF



4.2 MANPACK PACKAGES

4.2.1 MX9000 HF-90M Ultra-Light Manpack

ULTRA LIGHT PACKAGE FOR COMMUNICATING WHILE ON FOOT

The MX9000 Ultra-Light Manpack is ideal for military and paramilitary applications where size and weight are important. The MX9000 is the lightest military Manpack in the world. The Frequency Hopping option provides secure, jam-resistant HF communications.

Includes:

- HF-90M Transceiver
- Mil-Std Telephone Handset
- TA-99 Auto Tuner (with coaxial & earth cables)
- Collapsible Whip Antenna (8-section)
- Tape Whip Antenna
- Long Wire Antenna Kit
- Rechargeable 8.8Ah Li-Ion battery
- Ultra-Light Backpack



MX9000 ORDERING INFORMATION

Stock Code	Description	Weight
MX9000	Standard Manpack - Including Li-Ion battery and Li-Ion battery enclosure	5.00kg

Frequency Hopping / Encryption Options

QM9061	Frequency Hopping Option - Requires QM9056 Advanced Option 6, listed below	0.05kg
QM9065M	Digital Encryption Upgrade (Handset Option) - Upgrades standard handset with advanced embedded digital encryption modem	0.20kg

NOTE: Frequency Hopping and Encryption Options are subject to Australian Defence Export Controls and a signed End User Declaration must be provided for their supply. For more information see www.defence.gov.au/strategy/dtcc.

Recommended Options / Upgrades

QM9056	Advanced Option 6 Software and DTMF Tactical Telephone Handset	0.20kg
QM7005	End-fed Broadband Antenna	1.25kg
QM8024ML	DC Charger - For vehicle charging; Suits Li-Ion batteries	0.50kg
QM8000M	AC Mains Charger - Suits lithium batteries; Specify plug type (see section 4.12.7.1)	1.50kg

These options are the most commonly ordered options and recommended by Q-MAC to provide a comprehensive solution for most Manpack applications.

Miscellaneous Options/Accessories

QM8020M	Solar Panel Charger - Fold up unit; Suits lithium batteries	1.50kg
QM8035M	Hand Crank Generator - Suits military connector	2.70kg
QM8100	Rechargeable 8.8Ah Li-Ion battery and enclosure - Spare battery	1.50kg
QM8110	Rechargeable 17.6Ah Li-Ion battery and enclosure - Spare battery	2.50kg
QM9080M	Field Data Terminal - Tactical messaging terminal (see 4.5.2 for other options)	1.50kg

4.2.2 MX9011 HF-90M Military Grade Manpack with Metal Frame

A RUGGED MILITARY GRADE MANPACK FOR COMMUNICATING ON FOOT

The HF-90M Military Grade Monoblock Manpack is ideal for military and paramilitary applications where extreme environmental conditions require a protective metal frame. The Frequency Hopping option provides secure, jam-resistant HF communications.

Includes:

- HF-90M Transceiver
- Mil-Std Telephone Handset
- TA-99 Auto Tuner, (with coaxial & earth cables)
- Collapsible Whip Antenna (6-section)
- Long Wire Antenna Kit
- Tape Whip Antenna
- Rechargeable Battery (7 Ah SLA), complete with enclosure, charging and accessory power socket and battery condition monitor
- Ruggedised Full Frame Backpack with canvas accessory pockets



MX9011 ORDERING INFORMATION

Stock Code	Description	Weight
MX9011	Standard Manpack - Including 7 AH SLA battery and battery enclosure	11.00kg
MX9011b	Standard Manpack - Not including battery; Includes 7Ah SLA battery enclosure only	9.00kg
MX9011c	Standard Manpack - Including 8.8Ah Li-Ion battery and battery enclosure	10.00kg

Frequency Hopping / Encryption Options

QM9061	Frequency Hopping Option - Requires QM9056 Advanced Option 6, listed below	0.05kg
QM9065M	Digital Encryption Upgrade (Handset Option) - Upgrades standard handset with advanced embedded digital encryption modem.	0.20kg

NOTE: Frequency Hopping and Encryption Options are subject to Australian Defence Export Controls and a signed End User Declaration must be provided for their supply. For more information see www.defence.gov.au/strategy/dtcc.

Recommended Options / Upgrades

QM9056	Advanced Option 6 Software and DTMF Tactical Telephone Handset	0.20kg
QM7005	End-fed Broadband Antenna	1.25kg
QM8024M	DC Charger - For vehicle charging; Suits SLA batteries	0.30kg
QM8022M	AC Mains Charger - Suits SLA batteries; Specify plug type (See section 4.12.7.1)	1.00kg

These options are the most commonly ordered options and recommended by Q-MAC to provide a comprehensive solution for most Manpack applications.

Miscellaneous Options/Accessories

QM9080M	Field Data Terminal - Tactical messaging terminal (see 4.5.2 for other options)	1.50kg
QM8021M	Solar Panel Charger - Fold up unit; Suits SLA batteries	1.30kg
QM8035M	Hand Crank Generator - Suits military connector	2.70kg
QM8101	Rechargeable 7Ah SLA Battery and Enclosure Pack	3.50kg
QM8011	Rechargeable 7Ah SLA Battery Cell Only	2.55kg
QM8101b	Rechargeable 7Ah SLA Battery Enclosure Only	1.00kg

Lithium Ion Battery Options

QM8100	Rechargeable 8.8Ah Li-Ion Battery and Enclosure Pack	1.50kg
QM8110	Rechargeable 17.6Ah Li-Ion Battery and Enclosure Pack	2.50kg
QM8020M	Solar Panel Charger - Fold up unit; Suits Lithium batteries	1.50kg
QM8024ML	DC Charger - For vehicle charging; Suits Li-Ion batteries	0.50kg
QM8000M	AC Mains Charger - Suits Lithium batteries; Specify plug type (see section 4.12.7.1)	1.50kg

4.3 MOBILE (VEHICLE) PACKAGES

4.3.1 ML-90 NVIS Roof Rack Antenna Vehicle Package (Fixed Transceiver)

IMPROVED PERFORMANCE FROM A VEHICLE INSTALLATION

The Q-MAC ML-90 Roof Rack Antenna Vehicle Package (fixed transceiver) is ideal for NVIS propagation or applications requiring constant coverage for distances of 0 - 1000km. The ML-90 package provides significantly more gain than conventional whip antenna systems. The ML-90 is optimised for use in frequencies between 3.3-14MHz.

Q-MAC's ML-90 NVIS Roof Rack Antenna Vehicle Package (fixed) is ideal for border patrol, search and rescue operations and peace keeping applications. The ML-90 outperforms whip systems in mountains and valleys where NVIS propagation is essential. The ML-90 is also very effective at overcoming the 'Skip Zone' common with whip antenna systems.

Includes:

- HF-90M Transceiver, complete with microphone and DC power cable
- Transceiver Installation Kit, complete with mounting cradle and external mount speaker with audio mute facility
- ML-90 Auto-Tune Antenna System with cables and connectors
- ML-90 Installation Kit including roof-rack mounting hardware



Specify 12V or 24V version at time of order.

ML-90 / ML-91 ORDERING INFORMATION

Stock Code	Description	Weight
MX9027	ML-90 50 Watt Fixed Transceiver Package Standard Size 1.8m(L) x 1.25m(W) (This part number requires a rack mounting kit - see below for details)	110.00kg
MX9027b	ML-90 50 Watt Fixed Transceiver Package Short Size 1.5m(L) x 1.25m(W) (This part number requires a rack mounting kit - see below for details)	100.00kg
NOTE:	The MX9027 and MX9027b both include a mounting kit. Please order a suitable Roof Rack Mounting Option from the table below.	0.00kg

ML-90 / ML-91 NVIS Roof Rack Mounting Options Ordering Information

QM3100	Roof Rack Mounting Hardware - Gutter mount	0.00kg
QM3101	Roof Rack Mounting Hardware - Existing mounting track	0.00kg
QM3102	Roof Rack Mounting Hardware - Concealed gutter door jam	0.00kg
QM3103	Roof Rack Mounting Hardware - Track installation and mounting feet	0.00kg

Frequency Hopping / Encryption Options

QM9061	Frequency Hopping Option - Requires QM9056 Advanced Option 6, listed below	0.05kg
QM9065M	Digital Encryption Upgrade (Handset Option) - Upgrades standard handset with advanced embedded digital encryption modem	0.20kg
NOTE:	Frequency Hopping and Encryption Options are subject to Australian Defence Export Controls and a signed End User Declaration must be provided for their supply. For more information see www.defence.gov.au/strategy/dtcc.	

Recommended Options / Upgrades

QM9056	Advanced Option 6 Software and DTMF Tactical Telephone Handset	0.20kg
QM4023M	Rugged Military External Loud Speaker	1.00kg
QM4025M	Rugged Military External Loud Speaker with DSP Noise Reduction	1.00kg

These options are the most commonly ordered options and recommended by Q-MAC to provide a comprehensive solution for most Vehicle applications.

Miscellaneous Options/Accessories

QM9080M	Field Data Terminal - Tactical messaging terminal (see 4.5.2 for other options)	1.50kg
QM2160	Upgrade ML-90 Tuner to ML-91 125 Watt Capable Tuner	1.00kg

Due to receive characteristics of the ML-90 loop antenna, there is limited frequency range compatibility with the Frequency Hopping Option. The Q-MAC Electronics Pty Ltd ML-90 Vehicle Roof Rack Magnetic Loop Antenna System is protected in design by Australian Patent No 2001100423.

4.3.2 MX9015 HF-90M 50 Watt Vehicle Package with Whip Antenna

A MILITARY GRADE PACKAGE FOR VEHICLE INSTALLATIONS

The Q-MAC HF-90M Vehicle Package is a HF SSB radio communication system designed for long range mobile applications. The small footprint of the HF-90M transceiver makes it highly convenient for tight spaces in military vehicles, simplifying installation by eliminating the requirement to mount a separate control head or run control cabling to a remote control head.

Q-MAC's HF-90M Vehicle Package with whip antenna is ideal for border patrol, defence and paramilitary applications. The Frequency Hopping option provides a secure jam and intercept resistant HF link. With the addition of Anti-Vibration mounting platforms, the HF-90M can also be mounted in tracked vehicles.

Includes:

- HF-90M Transceiver
- Military Grade Telephone Handset (QM4016)
- Power Cable with military connector
- Vehicle Installation Kit with mounting cradle
- TA-90M Automatic Tuning Whip Antenna System covering 2-20MHz (for MX9015 50 Watt System)
- 4 Section Military Vehicle Antenna and US/NATO Base



NOTE: If 24V operation is required, please include the QM7601M option listed below.

MX9015 ORDERING INFORMATION

Stock Code	Description	Weight
MX9015	HF-90M 50 Watt Vehicle Transceiver Package - Split tuner/transceiver install	15.00kg
MX9015i	HF-90M 50 Watt Vehicle Transceiver Package - Integrated tuner/transceiver install	15.00kg

Frequency Hopping / Encryption Options

QM9061	Frequency Hopping Option - Requires QM9056 Advanced Option 6, listed below	0.05kg
QM9065M	Digital Encryption Upgrade (Handset Option) - Upgrades standard handset with advanced embedded digital encryption modem.	0.20kg

NOTE: Frequency Hopping and Encryption Options are subject to Australian Defence Export Controls and a signed End User Declaration must be provided for their supply. For more information see www.defence.gov.au/strategy/dtcc.

Recommended Options/Upgrades

QM9056	Advanced Option 6 Software and DTMF Tactical Telephone Handset	0.20kg
QM4023M	Rugged Military External Loud Speaker	1.00kg
QM4025M	Rugged Military External Loud Speaker with DSP Noise Reduction	1.00kg
QM2150M	Military Antenna Upgrade - Replaces 1.8m whip with 4 section whip and NATO/US antenna base	5.00kg

These options are the most commonly ordered options and recommended by Q-MAC to provide a comprehensive solution for most Vehicle applications.

Miscellaneous Options/Accessories

QM7601M	TA-90M Modification from 12 Volt Version to 24 Volt Version - Used with MX9015 package code	0.00kg
QM9080M	Field Data Terminal - Tactical messaging terminal (see 4.5.2 for other options)	1.50kg
QM7134M	Spare HF Antenna Elements - 3 x 1.32m sections and 1 x 0.66m section; Total length 4.66m	3.00kg

4.3.3 MX9115 HF-90M 150 Watt Vehicle Package with Military Whip Antenna System

A MILITARY GRADE PACKAGE FOR VEHICLE INSTALLATIONS

The Q-MAC HF-90M Vehicle Package is a HF SSB radio communication system designed for long-range mobile applications. The small footprint of the HF-90M transceiver makes it ideal for mounting in tight spaces common in military vehicles, simplifying installation by eliminating the requirement to mount a separate control head or run control cabling to a remote control head.

The addition of Q-MAC's HF-150M 150 Watt Amplifier and TA-91M Automatic Tuner increases signal strength and range performance.

Applications:

The Q-MAC HF-90M Vehicle Package with whip antenna is ideal for border patrol, defence and paramilitary applications. The Frequency Hopping option provides a secure jam and intercept resistant HF link. With the addition of Anti-Vibration platforms, the HF-90M can also be mounted in tracked vehicles.

Includes:

- HF-90M Transceiver
- Military Grade Telephone Handset (QM4016)
- Power Cable with Military Connector
- Mounting Cradle
- TA-91M Tuning Whip Antenna System covering 2-27MHz (for MX9115 150 Watt System)
- HF-150M 150 Watt SSB Amplifier
- 4 Section Military Vehicle Antenna and US/NATO Base



MX9115 ORDERING INFORMATION

Stock Code	Description	Weight
MX9115	150 Watt Vehicle Transceiver Package with HF-90M, HF-150M & TA-91M - 24V Operation	20.00kg

Frequency Hopping / Encryption Options

QM9061	Frequency Hopping Option - Requires QM9056 Advanced Option 6, listed below	0.05kg
QM9065M	Digital Encryption Upgrade (Handset Option) - Upgrades standard handset with advanced embedded digital encryption modem	0.20kg

NOTE: Frequency Hopping and Encryption Options are subject to Australian Defence Export Controls and a signed End User Declaration must be provided for their supply. For more information see www.defence.gov.au/strategy/dtcc.

Recommended Options/Upgrades

QM9056	Advanced Option 6 Software and DTMF Tactical Telephone Handset	0.20kg
QM4023M	Rugged Military External Loud Speaker	1.00kg
QM4025M	DSP Noise Reduction External Loudspeaker - Commercial grade enclosure	1.00kg

These options are the most commonly ordered options and recommended by Q-MAC to provide a comprehensive solution for most Vehicle applications.

Miscellaneous Options/Accessories

QM9080M	Field Data Terminal - Tactical messaging terminal (see 4.5.2 for other options)	1.50kg
QM7134M	Spare HF Antenna Elements - 3 x 1.32m sections and 1 x 0.66m section; Total length 4.66m	3.00kg

4.4 BASE STATION PACKAGES

4.4.1 MX9019 50 Watt Integrated HF-90M Base Station

AN INTEGRATED HF-90M TRANSCEIVER BASE STATION

The Q-MAC HF-90M Integrated Base Station is ideal for rapid deployment of a field or fixed base station. The main components, including transceiver, stand-by battery and power supply, are all contained in one integrated housing.

Applications:

Q-MAC's HF-90M Base Station Package is ideal for regional offices, temporary base stations and tactical field command applications.

Includes:

- HF-90M Transceiver
- Tactical Telephone Handset
- Panel Mounted Speaker with audio mute facility
- AC Mains Power Supply Unit complete with battery backup facility
- Standby Power Rechargeable Battery (7 Ah)
- Fixed Broadband Dipole Antenna - multi wire
- Halyard Kit
- Lightning Surge Arrestor Kit



MX9019 ORDERING INFORMATION

Stock Code	Description	Weight
MX9019	Integrated Base Station	42.00kg
NOTE:	Please also order an IEC mains cable to suit your region. Refer to Section 4.12.7.2 for details. One cable is included in the price of the MX9019.	0.05kg

Frequency Hopping / Encryption Options

QM9061	Frequency Hopping Option - Requires QM9056 Advanced Option 6, listed below	0.05kg
QM9065M	Digital Encryption Upgrade (Handset Option) - Upgrades standard handset with advanced embedded digital encryption modem	0.20kg
NOTE:	Frequency Hopping and Encryption Options are subject to Australian Defence Export Controls and a signed End User Declaration must be provided for their supply. For more information see www.defence.gov.au/strategy/dtcc .	

Recommended Options/Upgrades

QM9056	Advanced Option 6 Software and DTMF Tactical Telephone Handset	0.20kg
QM4026	Upgrades Standard Speaker to DSP Noise Reduction Loudspeaker	0.00kg

These options are the most commonly ordered options and recommended by Q-MAC to provide a comprehensive solution for most Base Station applications.

Miscellaneous Options/Accessories

QM9059	Advanced Option 9 Software and DTMF Desktop Pedestal Microphone with Military Connector	0.50kg
QM8011	Rechargeable 7Ah SLA Spare Battery - Internal back up battery replacement	2.55kg
QM9082M	Email and Chat Data Package	4.00kg
QM9080M	Field Data Terminal - Tactical messaging terminal (see 4.5.2 for other options)	1.50kg

4.4.2 MX9024 HF-90M 500W High Powered Base Station Package (complete)

A FIXED HF-90M TRANSCEIVER WITH THE 500W OUTPUT POWER

The Q-MAC HF-90M 500W Base Station Package is designed for strategic communications in base station applications. It includes a HF-90M transceiver coupled with solid state, 500 Watt amplifier and power supply, all contained in a versatile 19" equipment rack with casters.

Applications:

The Q-MAC HF-90M 500W Base Station Package is ideal for national or regional headquarters, embassies, military and border patrol applications. With the HF-90M Frequency Hopping Option, secure HF networks can be implemented.

Includes:

- HF-90M Transceiver with advanced software
- 19" 10RU Equipment Rack & Hardware
- Panel Mounted Speaker with audio mute facility
- AC Mains Power Converter Unit 90A/ 12V DC.
- 500 Watt Amplifier with Fan Kit
- Military Telephone Handset
- Headphones
- 3 Wire Centre-Fed Broadband Dipole Antenna (QM7003)
- 50m RG213 Coax Cable
- Halyard Kit
- Lightning Surge Arrestor Kit



MX9024 ORDERING INFORMATION

Stock Code	Description	Weight
MX9024	HF-90M 500 Watt High Power Base Station	65.00kg
NOTE:	Please also order an IEC mains cable to suit your region. Refer to Section 4.12.7.2 for details. One cable is included in the price of the MX9024.	0.05kg

Frequency Hopping / Encryption Options

QM9061	Frequency Hopping Option - Requires QM9056 Advanced Option 6, listed below	0.05kg
QM9065M	Digital Encryption Upgrade (Handset Option) - Upgrades standard handset with advanced embedded digital encryption modem	0.20kg
NOTE:	Frequency Hopping and Encryption Options are subject to Australian Defence Export Controls and a signed End User Declaration must be provided for their supply. For more information see www.defence.gov.au/strategy/dtcc .	

Recommended Options/Upgrades

QM9056	Advanced Option 6 Software and DTMF Tactical Telephone Handset	0.20kg
QM4026	Upgrades Standard Speaker to DSP Noise Reduction Loudspeaker	0.00kg

These options are the most commonly ordered options and recommended by Q-MAC to provide a comprehensive solution for most Base Station applications.

Miscellaneous Options/Accessories

QM9059	Advanced Option 9 Software and DTMF Desktop Pedestal Microphone with Military Connector	0.50kg
QM9082M	Email and Chat Data Package	4.00kg
QM9080M	Field Data Terminal - Tactical messaging terminal (see 4.5.2 for other options)	1.50kg

4.5 DATA PRODUCTS

4.5.1 QM9082M Email and Chat Data Package

HF MODEM FOR SIMPLE EMAIL, CHAT AND DATA TRANSFER

The combination of a Pactor 2 Level 3 Protocol modem with simple to use software and the HF-90M package provides long range email, file transfer and electronic chat capability over HF radio spectrum. The software provides password protected multi-user accounts with multi-site routing/forwarding.

Compatibility:

QM9082M HF Modem is compatible with all HF-90M packages.

Includes:

- HF Data Modem
- Email and Chat Client Software
- HF-90M Interface Unit and Interconnecting Cables
- HF-90M Fan Kit



QM9082M ORDERING INFORMATION

Stock Code	Description	Weight
QM9082M	Email and Chat Data Package	4.00kg

4.5.2 QM9080M Field Data Terminal

A DATA UNIT FOR SIMPLE MESSAGING WITHOUT A PC

Description:

The Field Data Terminal (FDT) is a hand held device that provides error free transmission of text based messages by the HF-90M. The FDT is ideal for tactical applications where text based messaging is required in a simple, easy to use format. The FDT is light weight, self contained and does not require a PC or radio modem. The FDT can be optioned with a GPS receiver to send and receive co-ordinates. The FDT can also be upgraded to encrypt messages to military standards.

Compatibility:

QM9080M FDT is compatible with all HF-90M packages.

Includes:

- Field Data Terminal, Carry Pouch and Quick Reference Card
- Connection Cable to HF-90M
- Mag Light Torch, 1 x 9V Battery and 2 x AA Batteries for night operations



ORDERING INFORMATION

Stock Code	Description	Weight
QM9080M	Field Data Terminal	1.50kg

Miscellaneous Options / Upgrades

QM9080C	Cryptographic Option - For securing messages with a key	0.01kg
QM9080G	GPS Option - Includes GPS receiver and software; Required QM9080C option	0.50kg
QM9080P	Field Data Printer - Tactical message printer for FDT	1.50kg

NOTE:

The Cryptographic Option is subject to Australian Defence Export Controls and a signed End User Declaration must be provided for supply of this option. For more information see www.defence.gov.au/strategy/dtcc.

4.5.3 QM9087M Secure Tactical Workstation

A COMPREHENSIVE WORKSTATION FOR EMAIL, MESSAGING, FREQUENCY PLANNING AND SITUATIONAL AWARENESS

Description:

The QM9087M Secure Tactical Workstation is designed to provide access to high end computer power, secure messaging and transmission facilities for tactical field users. The equipment is rugged, light weight and intuitive to use because of the familiar Microsoft Windows NT operating system. It is a comprehensive solution which includes hardware and software for secure email with attachments, mapping, moving map display, in-built GPS and communications planning and management. The complete workstation package gives the terminal user the ability to produce and process secure text and graphic data for transmission over a wide selection of networks, as well as access to map based situational awareness tools.



Compatibility:

QM9087M is compatible with all HF-90M packages.

Includes:

- Tactical Workstation
- Carry Case
- Connection Cables to HF-90M
- Built-in Software for messaging, email, mapping & frequency prediction



ORDERING INFORMATION

Stock Code	Description	Weight
QM9087M	Secure Tactical Workstation	10.00kg

NOTE: The Secure Tactical Workstation is subject to Australian Defence Export Controls and a signed End User Declaration must be provided for its supply. For more information see www.defence.gov.au/strategy/dtcc.

4.6 HF-90M TRANSCEIVER STANDALONE & OPTIONS

4.6.1 QM9101 HF-90M Transceiver (Military Grade)

SPARE TRANSCEIVER TO MAKE UP ADDITIONAL PACKAGES

Includes:

- 2 - 30 MHz Frequency Coverage
- 50 Watt PEP Power Output
- 12V - 24V Operating Voltage
- 255 Programmable Channels
- USB/LSB Toggle Switch
- Tune Function
- Clarifier
- Rx Signal Strength Indicator
- Erase Facility
- 6 Digit LED Display
- HF-90M Operation & Installation Guide



ORDERING INFORMATION

Stock Code	Description	Weight
QM9101	Standard HF-90M - Includes QM4016 non DTMF military telephone handset	1.55kg

Frequency Hopping / Encryption Options

QM9061	Frequency Hopping Option - Requires QM9056 Advanced Option 6, listed below	0.05kg
QM9065M	Digital Encryption Upgrade (Handset Option) - Upgrades standard handset with advanced embedded digital encryption modem	0.20kg

NOTE: Frequency Hopping and Encryption Options are subject to Australian Defence Export Controls and a signed End User Declaration must be provided for their supply. For more information see www.defence.gov.au/strategy/dtcc.

Software/Handset Options

QM9056	Advanced Option 6 Software and DTMF Tactical Telephone Handset	0.20kg
QM9059	Advanced Option 9 Software and DTMF Desktop Pedestal Microphone with Military Connector	0.50kg

These options are the most commonly ordered options and recommended by Q-MAC to provide a comprehensive solution for most applications.

Miscellaneous Options/Accessories

QM9090M	Custom Option - HF-90M power reduction to 20 Watts	0.01kg
QM9091M	Custom Option - HF-90M 3kHz filter option for data transmission	0.01kg

4.7 HF-90M FREQUENCY HOPPING & ENCRYPTION

4.7.1 QM9061 HF-90M Frequency Hopping Option (Factory Fitted)

MILITARY STANDARD PROTECTION AGAINST INTERCEPT AND JAMMING

Includes:

- 5 hops per second
- 256 kHz bandwidth (1 kHz spacing)
- Synchronization time of 25 seconds (average)
- Pseudo-random hopping sequence
- HF-90M Frequency Hopping User Guide

Only suitable for a HF-90M fitted with QM9056 Advanced Option 6.



ORDERING INFORMATION

Stock Code	Description	Weight
QM9061	Frequency Hopping Option - Factory fitted	0.05kg
NOTE:	Frequency Hopping and Encryption Options are subject to Australian Defence Export Controls and a signed End User Declaration must be provided for their supply. For more information see www.defence.gov.au/strategy/dtcc .	

4.7.2 QM9062 HF-90M Frequency Hopping Option (Field Upgrade to HF-90M)

MILITARY STANDARD PROTECTION AGAINST INTERCEPT AND JAMMING

Includes:

- 5 hops per second
- 256 kHz bandwidth (1 kHz spacing)
- Synchronization time of 25 seconds (average)
- Pseudo-random hopping sequence
- HF-90M Frequency Hopping User Guide

Includes firmware and extraction tool required to upgrade a HF-90M.
Only suitable for a HF-90M fitted with QM9056 Advanced Option 6.



ORDERING INFORMATION

Stock Code	Description	Weight
QM9062	Frequency Hopping Option - Requires QM9056 Advanced Option 6	0.15kg
NOTE:	Frequency Hopping and Encryption Options are subject to Australian Defence Export Controls and a signed End User Declaration must be provided for their supply. For more information see www.defence.gov.au/strategy/dtcc .	

4.7.3 QM9065M HF-90M Digital Encryption Option (Handset Option)

SECURE DIGITAL DATA ENCRYPTION

Description:

Enables protection against interception using advanced embedded digital encryption modem in a military standard tactical handset.

Includes:

- Software Programmable
- Secure Digital Data Encryption (not lower grade frequency inversion)
- Instant Synchronization

ORDERING INFORMATION

Stock Code	Description	Weight
QM9065M	HF-90M Digital Encryption Option - Handset option	0.20kg
NOTE:	Frequency Hopping and Encryption Options are subject to Australian Defence Export Controls and a signed End User Declaration must be provided for their supply. For more information see www.defence.gov.au/strategy/dtcc .	



4.8 ADVANCED OPTIONS - UPGRADES

Upgrade options only.

To purchase handsets as stand alone items for spare parts, please refer to the separate section on Handsets, (see 4.12 Other Parts & Accessories).

4.8.1 QM9056 Advanced Option #6

UPGRADE TO DTMF MIL-STD TELEPHONE HANDSET

Description:

Software and hardware option to upgrade a Standard Model HF-90M to an Advanced Model HF-90M. It replaces the standard Mil-Std telephone handset (QM4016 Telephone Handset (Military Grade)) with a DTMF Mil-Std telephone handset (QM4014 DTMF Handset (Military Grade)).



Compatibility:

Advanced Option #6 is suited to all MX90xx HF-90M packages.

Includes:

- Front-end Programming
- Selcall (based on CCIR 493-4)
- Telcall (based on CCIR 493-4)
- Beacon (based on CCIR 493-4)
- Selcall/Telcall Scan and Mute

ORDERING INFORMATION

Stock Code	Description	Weight
QM9056	Upgrade Advanced Option #6	0.20kg

4.8.2 QM9059 Advanced Option #9

UPGRADE TO DTMF DESKTOP MICROPHONE

Description:

Software and hardware option to convert a Standard Model HF-90M to an Advanced Model HF-90M. Replaces standard microphone with a DTMF Desktop gooseneck microphone with Mil-Std Connector (QM4006M DTMF Pedestal Microphone (with Military Connector)).



Compatibility:

Advanced Option #9 is suited to all MX9019 and MX9024 HF-90M packages.

Includes:

- Front-end Programming
- Selcall (based on CCIR 493-4)
- Telcall (based on CCIR 493-4)
- Beacon (based on CCIR 493-4)
- Selcall/Telcall Scan and Mute

ORDERING INFORMATION

Stock Code	Description	Weight
QM9059	QM9059 Advanced Option #9	0.50kg

4.8.3 HF-90M Package Options Matrix

USE THIS TABLE TO CLARIFY WHICH ADVANCED OPTIONS CAN BE ADDED TO HF-90M PACKAGES



Package Part Number and Description	Advanced Option #
MX9000 and MX9011 HF-90M Manpacks	6 (see 4.8.1)
MX9015, MX9115, MX9027 and MX9029 HF-90M Military Grade Vehicle Packages	6 (see 4.8.1)
MX9019 and MX9024 Base Station Packages	6 (see 4.8.1), 9 (see 4.8.2)

4.9 ANTENNA SYSTEMS

4.9.1 NVIS Roof Rack Antenna Systems

4.9.1.1 QM7113 ML-90 Auto-Tuning Antenna System (Rack and Tuner) for HF-90M 50W System

INNOVATIVE VEHICLE HF COMMUNICATION SOLUTION

Description:

The Q-MAC ML-90 Roof Rack Antenna Vehicle Package (fixed transceiver) is ideal for NVIS propagation or applications requiring constant coverage for distances of 0 - 1000km. The ML-90 package provides significantly more gain than conventional whip antenna systems. The ML-90 is optimised for use in frequencies between 3.3-14MHz.

Q-MAC's ML-90 NVIS Roof Rack Antenna Vehicle Package (fixed) is ideal for border patrol, search and rescue operations and peace keeping applications. The ML-90 outperforms whip systems in mountains and valleys where NVIS propagation is essential. The ML-90 is also very effective at overcoming the 'Skip Zone' common with whip antenna systems.

Compatibility:

Suitable for use with the Q-MAC HF-90M transceiver (not included).

*Limited frequency range compatibility with Frequency Hopping Option.
Specify 12V or 24V version at time of order.*



ORDERING INFORMATION

Stock Code	Description	Weight
QM7113	ML-90 Auto-tuning Antenna System Standard Size 1.8m(L) x 1.25m(W) (This part number requires a rack mounting kit - see below for details)	105.00kg
QM7113b	ML-90 Auto-tuning Antenna System Short Size 1.5m(L) x 1.25m(W) (This part number requires a rack mounting kit - see below for details)	90.00kg
NOTE:	The QM7113 and QM7113b both include a mounting kit. Please order a suitable Roof Rack Mounting Option from the table below.	0.00kg

ML-90 NVIS Roof Rack Mounting Options Ordering Information

QM3100	Roof Rack Mounting Hardware - Gutter mount	0.00kg
QM3101	Roof Rack Mounting Hardware - Existing mounting track	0.00kg
QM3102	Roof Rack Mounting Hardware - Concealed gutter door jam	0.00kg
QM3103	Roof Rack Mounting Hardware - Track installation and mounting feet	0.00kg

ML-90 NVIS Roof Rack Spare Parts

QM5078	ML-90 DC Feed Adaptor Cable - Cable to connect old version HF-90s (without DC feed on antenna socket) to current model ML-90	0.30kg
95312	ML-90/ML-91 Replacement Antenna Element - Replacement for damaged folding antenna element	5.00kg
QM5059	ML-90/ML-91 Replacement Cable ATU to Ground - Replacement cable to connect automatic antenna tuning unit to ground connection point	1.00kg
QM5062	ML-90/ML-91 Replacement High Voltage Cable - Replacement cable to connect automatic antenna tuning unit to antenna	1.00kg
QM5076	ML-90/ML-91 Replacement Cable ATU to Feed Box - Replacement cable to connect automatic antenna tuning unit to RF/DC feed box	1.00kg
95319	ML-90/ML-91 Wind Deflector Replacement Part	10.00kg
QM7122	ML-90 Automatic Antenna Tuner Unit Only - As supplied with QM7113 ML-90 NVIS antenna system	4.50kg
QM7123	ML-90 Antenna Feed Box Only - As supplied with QM7113 ML-90 NVIS antenna system	1.50kg

4.9.1.2 QM7114 ML-91 Auto-Tuning Antenna System (Rack and Tuner) for OEM 125W System

INNOVATIVE VEHICLE HF COMMUNICATION SOLUTION

Description:

The Q-MAC ML-91 Roof Rack Antenna Vehicle Package (fixed transceiver) is ideal for NVIS propagation or applications requiring constant coverage for distances of 0-1000km. The ML-91 package provides significantly more gain than conventional whip antenna systems. The standard size system is optimised for use in frequencies between 3.6-13MHz. The compact size system is optimised for use in frequencies between 3.7-13MHz.

Q-MAC's ML-91 system is ideal for border patrol, search and rescue operations and peace keeping applications. The ML-91 outperforms whip systems in mountains and valleys where NVIS propagation is essential. The ML-91 is also very effective at overcoming the 'Skip Zone' common with whip antenna systems.

Compatibility:

Suitable for use with Q-MAC, Codan™, Barrett Communications™ and Icom™ transceivers (not included). The maximum power rating of the ML-91 is 125W.

Limited frequency range compatibility with Q-MAC Frequency Hopping Option.



ORDERING INFORMATION

Stock Code	Description	Weight
QM7114-Q	ML-91 Auto-tuning Antenna System Standard Size 1.8m(L) x 1.25m(W) - Suitable for use with Q-MAC transceiver (transceiver not included)	105.00kg
QM7114-B	ML-91 Auto-tuning Antenna System Standard Size 1.8m(L) x 1.25m(W) - Suitable for use with Barrett transceiver (transceiver not included)	105.00kg
QM7114-C	ML-91 Auto-tuning Antenna System Standard Size 1.8m(L) x 1.25m(W) - Suitable for use with Codan transceiver (transceiver not included)	105.00kg
QM7114-I	ML-91 Auto-tuning Antenna System Standard Size 1.8m(L) x 1.25m(W) - Suitable for use with Icom transceiver (transceiver not included)	105.00kg
QM7114b-Q	ML-91 Auto-tuning Antenna System Compact Size 1.5m(L) x 1.25m(W) - Suitable for use with Q-MAC transceiver (transceiver not included)	95.00kg
QM7114b-B	ML-91 Auto-tuning Antenna System Compact Size 1.5m(L) x 1.25m(W) - Suitable for use with Barrett transceiver (transceiver not included)	95.00kg
QM7114b-C	ML-91 Auto-tuning Antenna System Compact Size 1.5m(L) x 1.25m(W) - Suitable for use with Codan transceiver (transceiver not included)	95.00kg
QM7114b-I	ML-91 Auto-tuning Antenna System Compact Size 1.5m(L) x 1.25m(W) - Suitable for use with Icom transceiver (transceiver not included)	95.00kg
NOTE:	All QM7114 and QM7114b variations include a mounting kit. Please order a suitable Roof Rack Mounting Option from the table below.	0.00kg

ML-91 NVIS Roof Rack Mounting Options Ordering Information

QM3100	Roof Rack Mounting Hardware - Gutter mount	0.00kg
QM3101	Roof Rack Mounting Hardware - Existing mounting track	0.00kg
QM3102	Roof Rack Mounting Hardware - Concealed gutter door jam	0.00kg
QM3103	Roof Rack Mounting Hardware - Track installation and mounting feet	0.00kg

ML-91 NVIS Roof Rack Spare Parts

QM5078-Q	ML-91 Control Cable - Cable to connect transceiver to ML-91 ATU - Suitable for use with Q-MAC transceiver	0.50kg
QM5078-B	ML-91 Control Cable - Cable to connect transceiver to ML-91 ATU - Suitable for use with Barrett transceiver	0.50kg
QM5078-C	ML-91 Control Cable - Cable to connect transceiver to ML-91 ATU - Suitable for use with Codan transceiver	0.50kg
QM5078-I	ML-91 Control Cable - Cable to connect transceiver to ML-91 ATU - Suitable for use with Icom transceiver	0.50kg
95312	ML-90/ML-91 Replacement Antenna Element	5.00kg
QM5059	ML-90/ML-91 Replacement Cable ATU to Ground	1.00kg
QM5062	ML-90/ML-91 Replacement High Voltage Cable	1.00kg
QM5076	ML-90/ML-91 Replacement Cable ATU to Feed Box	1.00kg
QM7125	ML-91 Automatic Antenna Tuner Unit Only - As supplied with QM7114-X systems	4.50kg
95319	ML-90/ML-91 Wind Deflector Replacement Part	10.00kg

4.9.2 Vehicle Whip Antenna Systems

4.9.2.1 QM7112M TA-90M 50W Auto-Tune Antenna System

Description:

The TA-90M is a compact, fully-automatic antenna tuner in robust metal housing. Designed specifically for use with the HF-90, it allows delivery of maximum power, over 2-20 MHz, to a range of short whip or wire antennas.

Compatibility:

Compatible with HF-90M Frequency Hopping Option/Upgrade in Frequency Range approximately 4 to 20 MHz. As supplied with the MX9015 HF-90M Vehicle Package.

Includes:

- TA-90 Automatic Antenna Tuner in die-cast metal housing
- Heavy-duty mounting bracket
- Pair of 45mm C-clamps
- Pair of 50mm C-clamps
- Cables
- Military 4 section Whip Antenna and Base System

Specify either 12V (QM7112M) or 24V (QM7112Ma) version at time of order.



TA-90 ORDERING INFORMATION

Stock Code	Description	Weight
QM7112M	TA-90M Auto-Tune Antenna System (12V)	10.00kg
QM7112Ma	TA-90M Auto-Tune Antenna System (24V)	10.00kg

Spares And Accessories Ordering Information

QM7121M	TA-90M Tuner (12V Version) - Supplied complete with mounting bracket assembly; As supplied with the TA-90M auto-tune antenna system	2.40kg
QM7121Ma	TA-90M Tuner (24V Version) - Supplied complete with mounting bracket assembly; As supplied with the TA-90M auto-tune antenna system	2.40kg
QM6071M	TA-90M Mounting Kit - Kit includes all items as supplied with TA-90 Auto-tune antenna system minus the TA-90M tuner and antenna system	2.45kg
QM7137	C-Clamps 60mm - To fix TA-90 mounting plate to larger diameter bull-bar	0.30kg

The TA-90M (12V & 24V) is partially compatible with HF-90 Frequency Hopping Option/Upgrades from approx. 4 to 20 MHz.

Military Whip Antenna System - Spares and Accessories

QM7134M	Military HF Vehicle Antenna Elements - 3 x 1.32m Section (split configuration) and 1 x 0.66M Section; Military grade rugged aluminium anodized whip antenna; Connected with spring loaded steel bayonet fixing; Mounts to QM7138M; Total length 4.66m	3.00kg
QM7138M	Military HF Antenna Base - Suits QM7134M; Heavy duty antenna base with spring; NATO and US mounting holes	3.00kg
QM7139M	Military HF Antenna and Base Combination - 3 x 1.32M and 1 x 0.66M sectional vehicle antenna with antenna base with spring; NATO and US mounting holes	6.00kg

4.9.2.2 QM7921M TA-91M 150W Antenna Auto Tuner

Description:

The TA-91M is a fully-automatic antenna tuner in robust metal housing, capable of 150W operation between 2 to 30 MHz. It includes a 4.5m control cable and 4.5m coax cable with matching connectors from the TA-91M to HF-150M (HF-150M not included).

Compatibility:

Compatible with HF-90M Frequency Hopping Option/Upgrade in Frequency Range approximately 4 to 27 MHz. As supplied with the HF-90M 150 Watt Vehicle Package (MX9115).

Includes:

- Die-cast metal housing
- Cables
- Sectional Military Whip Antenna Systems (3 x 1.32m sections; 1 x 0.66m section)
- US/NATO Standard Antenna Base

24V Version.



TA-91 ORDERING INFORMATION

Stock Code	Description	Weight
QM7921M	TA-91M Tuner (24V Version) - As supplied with the TA-91M Auto-tune Antenna System; Tunes military vehicle whip antenna system from 2-30MHz	5.00kg

The TA-91M (24V) is partially compatible with HF-90 Frequency Hopping Option/Upgrades from approx. 4 to 27 MHz.

Military Whip Antenna System - Spares and Accessories

QM7134M	Military HF Vehicle Antenna Elements - 3 x 1.32M section (split configuration) and 1 x 0.66m section; Military grade rugged aluminium anodized whip antenna; Connected with spring loaded steel bayonet fixing; Mounts to QM7138M; Total length 4.66m	3.00kg
QM7138M	Military HF Antenna Base - Suits QM7134M; Heavy duty antenna base with spring; NATO and US mounting holes	3.00kg
QM7139M	Military HF Antenna and Base Combination - 3 x 1.32m and 1 x 0.66m sectional vehicle antenna with antenna base with spring. NATO and US mounting holes	6.00kg

4.9.3 QM9201M HF-150M 150W HF SSB Booster Amplifier

Description:

The Q-MAC HF-150M HF SSB Power Amplifier increases the output power of HF-90M transceivers to 150 Watts PEP across the HF frequency band. When used with the Q-MAC HF-90M transceiver, the amplifier will provide continuous coverage from 2 to 30 MHz and is compatible with the HF-90M Frequency Hopping option. The unit is designed for continuous duty cycle without the need for any forced air cooling. When integrated with the TA-91M Automatic Antenna Tuner, the system is automatically configured, without the need for any special operator input.

Applications:

The HF-150M is designed for applications where medium power tactical communications is required. Applications include land mobile vehicles, tracked vehicles, patrol boats and base station installations. Anti-Vibration mounts may be required for some platforms.

Compatibility:

Compatible with the HF-90M Frequency Hopping Option/Upgrade in the frequency range approximately 4 to 30 MHz.



HF-150 ORDERING INFORMATION

Stock Code	Description	Weight
QM9201M	HF-150M 150W HF SSB Booster Amplifier (24V)	6.50kg

4.9.4 Manpack Antenna Systems

4.9.4.1 QM2101 TA-99 Automatic Tuner

Description:

Automatic antenna tuning unit, incorporating LED tuning indicator. Supplied with spare coaxial cable.

Compatibility:

The TA-99 suits collapsible whip, tape and long wire antennas. As supplied in Manpack packages.



ORDERING INFORMATION

Stock Code	Description	Weight
QM2101	TA-99 Automatic Tuner	0.90kg

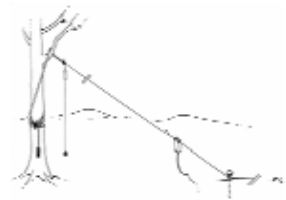
4.9.4.2 QM7005 Portable Broadband Antenna (Standard Version)

Description:

End-fed broadband antenna, 2-30 MHz, 100 Watt rating, made from insulated wire (for easy handling), incorporating counterpoise and earth-clip, complete with 5m RG-58 coaxial cable with connectors, throw cords and earth stake. Antenna is supplied on a shuttle for easy deployment and storage.

Compatibility:

Available as an option for Manpack packages.



ORDERING INFORMATION

Stock Code	Description	Weight
QM7005	Portable Broadband Antenna - Standard version	1.25kg

4.9.4.3 QM7303 Collapsible Whip Antenna (8-section)

Description:

High efficiency collapsible eight-section whip antenna (3m). As supplied with the MX9000 HF-90M Manpack. Collapsed length: 390mm.

Frequency Coverage:

With TA-99 Automatic Tuner: 2-26MHz

With TA-99 & Frequency Hopping: 4-26MHz



ORDERING INFORMATION

Stock Code	Description	Weight
QM7303	Collapsible Whip Antenna (8-section)	0.30kg

4.9.4.4 QM7301 Collapsible Whip Antenna (6-section)

Description:

High efficiency collapsible six section whip antenna (3m). As supplied with the MX9011 HF-90M Manpack. Collapsed length = 500mm.

Frequency Coverage:

With TA-99 Automatic Tuner: 2-26MHz

With TA-99 & Frequency Hopping: 4-26MHz



ORDERING INFORMATION

Stock Code	Description	Weight
QM7301	Collapsible Whip Antenna (6-section)	0.30kg

4.9.4.5 QM7302 Collapsible Whip Antenna (2-section)

Description:

Collapsible two section whip antenna (1m), complete with flexible goose neck.
Collapsed length = 495mm.

Frequency Coverage:

With TA-99 Automatic Tuner: 3.5-26MHz
With TA-99 & Frequency Hopping: 3.5-26MHz



ORDERING INFORMATION

Stock Code	Description	Weight
QM7302	Collapsible Whip Antenna (2-section)	0.20kg

4.9.4.6 QM7305 Tape Whip Antenna

Description:

Flexible tape whip antenna (1.10m) complete with flexible goose neck. Suitable for use in jungle/forestry areas. As supplied with the MX9000 and MX9011 HF-90M Manpacks.

Frequency Coverage:

With TA-99 Automatic Tuner: 3.5-26MHz
With TA-99 & Frequency Hopping: 3.5-26MHz



ORDERING INFORMATION

Stock Code	Description	Weight
QM7305	Tape Whip Antenna	0.20kg

4.9.4.7 QM7351 Antenna Extender Coil Section

Description:

Extends the operation of Collapsible Whip Antenna (6 and 8 section) down to 2.7 MHz. This allows operation between 2.7 and 3.6 MHz (i.e. to the lower frequency limit of the collapsible whip antenna (6 and 8 section)). Length: 500mm.

Compatibility:

Not suitable for use with QM7302 or QM7305 whip antennas.
Not suitable for use with HF-90 Frequency Hopping Option/Upgrades due to insufficient bandwidth.



ORDERING INFORMATION

Stock Code	Description	Weight
QM7351	Antenna Extender Coil Section	0.20kg

4.9.4.8 QM7821 Antenna Angle Adaptor

Description:

Suited for use with Collapsible Whip Antenna (6 and 8 section). Allows adjustment of antenna angle to facilitate NVIS propagation.

Compatibility:

Suitable for use with TA-99 Automatic Tuner.



ORDERING INFORMATION

Stock Code	Description	Weight
QM7821	Antenna Angle Adaptor	0.10kg

4.9.4.9 QM7310 Long Wire Antenna Kit

Description:

Suitable for use with TA-99 Automatic Tuner as a rapid-use antenna system. As supplied with the HF-90M Manpacks.

Frequency Coverage:

With TA-99 Automatic Tuner: 2-20 MHz

Includes:

- Long Wire Antenna (7m)
- Counterpoise (5m)
- Long Wire Antenna Adaptor (fits TM-90 and TA-99 tuners)
- Throw Rope



ORDERING INFORMATION

Stock Code	Description	Weight
QM7310	Long Wire Antenna Kit	0.45kg

4.9.5 Base Station Antenna Systems

4.9.5.1 QM7001 Fixed Broadband Dipole Antenna - Single Wire

Description:

Single wire centre-fed broadband dipole, 2-30 MHz, 130 Watt Data, 250 Watt Voice, PEP rating, stainless steel construction, complete with 30 metres RG-58 coaxial cable with connectors. Simple installation.

Includes:

Includes Halyard Kit. Not supplied with installation accessories such as poles/masts.



ORDERING INFORMATION

Stock Code	Description	Weight
QM7001	Fixed Broadband Dipole Antenna - Single wire	3.00kg

4.9.5.2 QM7022 Mast Kit for Broadband Dipole Antenna

Description:

Mast kit to suit portable use of single wire broadband dipole antenna.

Includes:

Comes with canvas bag. Not supplied with installation accessories such as poles/masts.

ORDERING INFORMATION

Stock Code	Description	Weight
QM7022	Mast Kit for Broadband Dipole Antenna	13.00kg

4.9.5.3 QM7002 Fixed Broadband Dipole Antenna - Multi Wire

Description:

3-wire centre-fed broadband dipole, 2-30 MHz, 130 Watt Data, 250 Watt Voice rating, stainless steel construction with fibreglass spreaders complete with 30 metres RG-58 coaxial cable with connectors. As supplied with the HF-90M Integrated Base Station Package.

Includes:

Includes parts and instructions to mount in horizontal or inverted V configurations. Includes Halyard Kit. Not supplied with installation accessories such as poles/masts.



ORDERING INFORMATION

Stock Code	Description	Weight
QM7002	Fixed Broadband Dipole Antenna - Multi wire	12.00kg

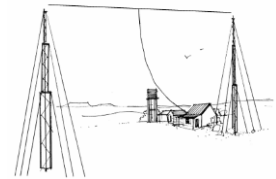
4.9.5.4 QM7003 Fixed Broadband Dipole Antenna - Multi Wire High Power

Description:

3-wire centre-fed broadband dipole, 2-30 MHz, 500 Watt Data, 1000 Watt Voice rating, stainless steel construction with fibreglass spreaders complete with 30 metres RG-58 coaxial cable with connectors. As supplied with the HF-90M 500W High Power Base Station Package.

Includes:

Includes parts and instructions to mount in horizontal or inverted V configurations. Includes Halyard Kit. Not supplied with installation accessories such as poles/masts.



ORDERING INFORMATION

Stock Code	Description	Weight
QM7003	Fixed Broadband Dipole Antenna - Multi wire high power	18.00kg

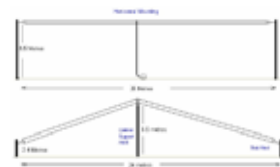
4.9.5.5 QM7004 Fixed Terminated Folded Dipole Broadband Antenna

Description:

Folded Dipole Broadband Antenna 5-18 MHz, 100 Watt Data, 150 Watt Voice rating, stainless steel construction with UV resistant spreaders complete with 30 metres RG-58 coaxial cable with connectors.

Includes:

Includes parts and instructions to mount in horizontal or inverted V configurations. Includes Halyard Kit. Not supplied with installation accessories such as poles/masts.



ORDERING INFORMATION

Stock Code	Description	Weight
QM7004	Fixed Terminated Folded Dipole Broadband Antenna	6.00kg

4.9.5.6 QM7023 Lightning Surge Arrestor Kit

Description:

Ideal for protecting fixed Base Station installations. Included in MX9019 packages.

Includes:

- 1 x Surge Arrestor
- 1 x Earthing Rod, Cable Clamp and Earthing Strap
- 1 x 5m Coaxial Cable

ORDERING INFORMATION

Stock Code	Description	Weight
QM7023	Lightning Surge Arrestor Kit	10.00kg

4.9.5.7 QM7024 Lightning Surge Arrestor Kit - High Power Base

Description:

Ideal for protecting fixed Base Station installations. Included in MX9024 packages.

Includes:

- 1 x Surge Arrestor
- 1 x Earthing Rod, Cable Clamp and Earthing Strap
- 1 x 5m Coaxial Cable

ORDERING INFORMATION

Stock Code	Description	Weight
QM7024	Lightning Surge Arrestor Kit - High power base	10.00kg

4.9.5.8 QM7021 Halyard Kit

Description:

Ideal for installing the QM7001, QM7002 and QM7003 Fixed Dipole Broadband Antennas. Included in QM7001, QM7002 and QM7003.

Includes:

- 2 x 30m UV-Stable Rope (6mm)
- 2 x Stainless Steel Pulleys
- 2 X Stainless Steel D Shackles

ORDERING INFORMATION

Stock Code	Description	Weight
QM7021	Halyard Kit	0.60kg

Other antenna types are available on application.

4.10 POWER SUPPLIES, CHARGERS & ACCESSORIES

4.10.1 QM8101 Military Grade Battery (7Ah)

Description:

7Ah sealed lead acid (SLA) battery in military grade casing. Suits MX9011 HF-90M Manpack.



ORDERING INFORMATION

Stock Code	Description	Weight
QM8101	Military Grade Battery (7Ah)	3.50kg

4.10.2 QM8101b Military Grade Battery Enclosure

Description:

Military grade battery enclosure for 7Ah SLA battery. Suits MX9011 HF-90M Manpack.

Battery enclosure ONLY. Battery NOT included.

Q-MAC can not warrant the performance of the HF-90 transceiver if the battery is not supplied by Q-MAC.



ORDERING INFORMATION

Stock Code	Description	Weight
QM8101b	Military Grade Battery Enclosure	1.00kg

4.10.3 QM8011 Rechargeable Battery (7Ah)

Description:

12V 7Ah sealed lead acid (SLA) gel battery (non-hazardous for freight purposes). As used with QM8101b battery enclosure (above) for the MX9011 Manpack.



ORDERING INFORMATION

Stock Code	Description	Weight
QM8011	Rechargeable Battery (7Ah)	2.55kg

4.10.4 QM8100 Mil-Std 8.8Ah Li-Ion Battery Pack

Description:

8.8Ah Lithium Ion (Li-Ion) battery in military grade casing. Suits MX9000 and MX9011C HF-90M Manpacks.

Includes custom Li-Ion battery pack.



ORDERING INFORMATION

Stock Code	Description	Weight
QM8100	Mil-Std 8.8Ah Li-Ion Battery Pack	1.50kg

4.10.5 QM8100b Mil-Std 8.8Ah Li-Ion Battery Enclosure

Description:

Military grade battery enclosure for the 8.8Ah Lithium Ion battery. Suits MX9000 and MX9011C HF-90M Manpacks.

This is a battery enclosure ONLY. A battery is NOT included.

Q-MAC can not warrant the performance of the HF-90 transceiver if the battery is not supplied by Q-MAC.



ORDERING INFORMATION

Stock Code	Description	Weight
QM8100b	Mil-Std 8.8Ah Li-Ion Battery Enclosure	0.50kg

4.10.6 QM8110 Mil-Std 17.6Ah Li-Ion Battery Pack

Description:

17.6Ah Lithium Ion (Li-Ion) battery in military grade casing with military connector. Suits the MX9011 HF-90M Manpack.



ORDERING INFORMATION

Stock Code	Description	Weight
QM8110	Mil-Std 17.6Ah Li-Ion Battery Pack	2.50kg

4.10.7 QM8110b Battery Enclosure (Military Grade)

Description:

Military grade battery enclosure for a 17.6Ah Li-Ion battery. Suits MX9011C HF-90M Manpack.

Battery enclosure ONLY. Battery NOT included.

Q-MAC can not warrant the performance of the HF-90 transceiver if the battery is not supplied by Q-MAC.



ORDERING INFORMATION

Stock Code	Description	Weight
QM8110b	Battery Enclosure - Military grade	1.00kg

4.10.8 QM8010 Li-Ion Replacement Cell Pack (8.8Ah)

Description:

14.8V 8.8Ah Lithium Ion battery pack (dangerous goods classification for freight purposes). As used with QM8100b and QM8110b battery enclosures (above).

ORDERING INFORMATION

Stock Code	Description	Weight
QM8010	Li-Ion Replacement Cell Pack (8.8Ah)	1.00kg

4.10.9 QM8000M AC Mains Li-Ion Charger (2A)

Description:

Compact charger to suit Lithium Ion battery packs - 100-250 Volt AC input, 2A limited current. Supplied with specified AC mains plug (2-pin). As used with MX9000 and MX9011C Manpacks.



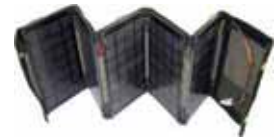
ORDERING INFORMATION

Stock Code	Description	Weight
QM8000M	AC Mains Li-Ion Charger (2A)	1.50kg
NOTE:	Please also order a Figure 8 mains cable to suit your region. Refer to Section 4.12.7.1 for details. One cable is included in the price of the QM8000M.	0.05kg

4.10.10 QM8020M Fold-Up Solar Panel Charger - Li-Ion Only

Description:

Suits Q-MAC Lithium Ion Batteries - 10.8 Watt rated power, complete with extension cable and mating connector to suit military grade packages. Comprises five panels, which fold into a compact canvas pouch. Suited to MX9000 and MX9011C Manpacks.



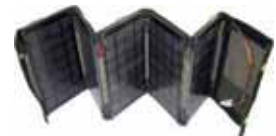
ORDERING INFORMATION

Stock Code	Description	Weight
QM8020M	Fold-Up Solar Panel Charger - Li-Ion only	1.50kg

4.10.11 QM8021M Fold-Up Solar Panel Charger

Description:

Suits Q-MAC Rechargeable SLA Batteries - 10.8 Watt rated power, complete with extension cable and mating connector to suit military grade packages. Comprises five panels, which fold into a compact canvas pouch. Suited to MX9011 Manpack.



ORDERING INFORMATION

Stock Code	Description	Weight
QM8021M	Fold-Up Solar Panel Charger	1.30kg

4.10.12 QM8022M AC Mains Charger (2A)

Description:

Compact desk-top unit to suit Q-MAC Rechargeable SLA Batteries - 115/230 Volt AC input, 12 Volt DC nominal, 2 Amp limited current, complete with charging status LED indicators. As used with the MX9011 Manpack. Supplied with specified AC mains plug.



ORDERING INFORMATION

Stock Code	Description	Weight
QM8022M	AC Mains Charger (2A)	1.00kg
NOTE:	Please also order a Figure 8 mains cable to suit your region. Refer to Section 4.12.7.1 for details. One cable is included in the price of the QM8022M.	0.05kg

4.10.13 QM8024M DC Step-Up Battery Charger

Description:

Suits Q-MAC SLA Rechargeable Batteries - Steps up battery voltage to 14.5 Volt for charging via a vehicle cigarette lighter socket, complete with mating connector for MX9011 HF-90M Manpack.



ORDERING INFORMATION

Stock Code	Description	Weight
QM8024M	DC Step-Up Battery Charger	0.30kg

4.10.14 QM8024ML DC Step-Up Battery Charger

Description:

Suits Q-MAC Rechargeable Li-Ion Batteries - Smart DC Li-Ion Battery Charger Volt for charging via vehicle cigarette lighter socket, complete with mating connector for MX9000 and MX9011C HF-90M Manpacks.



ORDERING INFORMATION

Stock Code	Description	Weight
QM8024ML	DC Step-Up Battery Charger	0.50kg

4.10.15 QM8051M Battery Condition Monitor

Description:

Battery condition monitor to suit SLA Batteries only. Monitors battery charge level via a series of LED indicators. Suited to the battery supplied in the MX9011 Manpack.



ORDERING INFORMATION

Stock Code	Description	Weight
QM8051M	Battery Condition Monitor	0.10kg

4.10.16 QM8035M Hand Crank Generator (with Mounts)

Description:

Suits Q-MAC SLA Rechargeable Batteries - Output voltage between 13.8 - 16.2V, output current between 1.15 - 1.35A (assumes 60RPM and 12 Ohm resistive load). Light weight, yet built from high impact material (meets Mil Std 810).

Includes:

- Tripod
- Canvas Bag
- Tree Mount (with strap)



ORDERING INFORMATION

Stock Code	Description	Weight
QM8035M	Hand Crank Generator - With mounts	2.70kg

4.11 CARRY PACKS & CASES

4.11.1 QM6006 All Welded Backpack Frame (Military Grade)

Description:

Ruggedised all steel backpack frame and canvas webbing for MX9011 Manpack. Standard colour is Black frame with Olive Drab canvas pockets.

Dimensions:

490H x 400W x 250D mm (including frame and waist support).

Note:

Accessories pictured (radio, tuner, battery, handset, antenna, etc) are not included.



ORDERING INFORMATION

Stock Code	Description	Weight
QM6006	All Welded Backpack Frame - Military grade	9.00kg

4.11.2 QM6000 UltraLight Backpack

Description:

Custom designed single-unit backpack made from water resistant canvas, padded with compartments to house the HF-90M, TA-99 and Li-Ion battery accessories and antenna. As supplied with the HF-90M MX9000 Package. Standard colour is Olive Drab.

Dimensions:

335H x 192W x 85D mm (excluding antenna holder).

Note:

Accessories (radio, tuner, battery, handset, antenna, etc) not included.



ORDERING INFORMATION

Stock Code	Description	Weight
QM6000	QM6000 UltraLight Backpack for Monoblock	1.00kg

4.11.3 QM6017 Rugged DataPack Case

Description:

Extremely rugged and fully-waterproof (submersible) case. As supplied with the Email/Chat Data Package.

Dimensions:

Inside: 240H x 185W x 155D mm
Outside: 273H x 247W x 177D mm



ORDERING INFORMATION

Stock Code	Description	Weight
QM6017	Data Pack Case - Black	0.80kg
QM6017Y	Data Pack Case - Yellow	0.80kg

4.12 OTHER PARTS & ACCESSORIES

4.12.1 Installation Accessories

4.12.1.1 QM6063 Mounting Cradle for HF-90M on TA-90M

Description:

Robust mounting cradle for the HF-90M on the TA-90M Auto Tuner. Suited to vehicle and base station applications.



ORDERING INFORMATION

Stock Code	Description	Weight
QM6063	Mounting Cradle for HF-90M on TA-90M	1.00kg

4.12.1.2 QM6052M HF-90M Vehicle Installation Kit

Includes:

- Mounting Cradle (QM6061)
- Coaxial Cable (RG-58) & Connectors (4.5m)
- HRC Fuse (20 Amp) and Holder
- Battery Lugs (Heavy Duty), Cable Ties, Grommets and Self-Amalgamating Tape

As supplied with the HF-90M Vehicle Package.

Note:

QM5001M DC power cable (see 4.12.5.1) is not included with the HF-90M Vehicle Installation Kit and should be ordered separately if required.

ORDERING INFORMATION

Stock Code	Description	Weight
QM6052M	HF-90M Vehicle Installation Kit	1.30kg

4.12.1.3 QM6061 Mounting Cradle

Description:

Mounting cradle suited to vehicle and base station applications. As supplied with the HF-90M Vehicle Installation Kit and HF-90M Base Station Package.



ORDERING INFORMATION

Stock Code	Description	Weight
QM6061	Mounting Cradle	0.35kg

4.12.2 Audio Accessories

4.12.2.1 QM4042M Headphones (Military Grade)

Description:

Military grade headset incorporating 6.25 mm jack plug. Suits CW option and telegraph key.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4042M	Headphones - Military grade	0.45kg

4.12.2.2 QM4023M Rugged External Mount Speaker (with Audio Mute)

Description:

Rugged external mount speaker incorporating audio mute facility for fixed channel operation.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4023M	Rugged External Mount Speaker - With audio mute	1.00kg

4.12.2.3 QM4025M Rugged External Mount Speaker (with DSP Noise Reduction)

Description:

Noise Eliminating Speaker incorporating Digital Signal Processing (DSP) technology to remove unwanted background noise from speech. Fully Adaptive noise cancelling. Plug & go - No adjustments necessary.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4025M	Rugged External Mount Speaker - With DSP noise reduction	1.00kg

4.12.2.4 QM4051M CW Options & Telegraph Key

Description:

External CW option housed in a compact die-cast metal box with telegraph key mounted on top. Incorporates a 6.25 mm mono jack for connection of suitable headphones. Supplied with 1.5m lead.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4051M	CW Options & Telegraph Key	1.00kg

4.12.3 Pedestal Microphone

4.12.3.1 QM4006M DTMF Pedestal Microphone (with Military Connector)

Description:

DTMF desktop gooseneck microphone with Mil-Std Connector. Suited to MX9019 and MX9024 HF-90M packages.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4006M	DTMF Pedestal Microphone - With military connector	1.00kg

4.12.4 Telephone Handsets

4.12.4.1 QM4014 DTMF Handset (Military Grade)

Description:

Industry standard, military grade telephone handset with military connector and DTMF keys for use with advanced software features such as Selcall, Beacon Call, Frequency Hopping and Front Panel Programming. For use with Mil-Spec Model HF-90M.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4014	DTMF Handset - Military grade	0.45kg

4.12.4.2 QM4016 Telephone Handset (Military Grade)

Description:

Industry standard, military grade, non-DTMF telephone handset with Mil-Spec connector. For use with Mil-Spec Model HF-90M.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4016	Telephone Handset - Military grade	0.45kg

4.12.4.3 QM4017M Military Handset with Digital Encryption

Description:

Enables protection against interception using advanced embedded digital encryption modem in a military standard tactical handset.

Includes:

- Software Programmable
- Secure Digital Data Encryption (not lower grade frequency inversion)
- Instant Synchronization



ORDERING INFORMATION

Stock Code	Description	Weight
QM4017M	HF-90M Military Handset with Digital Encryption Option	0.45kg

NOTE: Frequency Hopping and Encryption Options are subject to Australian Defence Export Controls and a signed End User Declaration must be provided for their supply. For more information see www.defence.gov.au/strategy/dtcc.

4.12.4.4 QM4745 Combat Helmet with Integral Audio Headset

Description:

Combat helmet; complete with headset, Y cable and integral ear mount PTT. Helmet is supplied with a connector to fit the front socket of the HF-90M Transceiver.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4745	Combat Helmet with Integral Audio Headset	4.00kg

4.12.5 DC Power Cables

4.12.5.1 QM5001M HF-90M → Misc Power Source (4.5m)

Description:

Military power connector at one end complete with connector for external speaker on flying lead, bare ended at the other end. As supplied with the HF-90M Vehicle. (If installation kit with fuse is required, please add QM6052M HF-90M Vehicle Installation Kit).

ORDERING INFORMATION

Stock Code	Description	Weight
QM5001M	HF-90M → Misc Power Source (4.5m)	2.00kg

4.12.6 Coaxial Cables (RG-58)

4.12.6.1 QM5021 HF-90M → Vehicle Antenna (4.5m)

Description:

BNC connector fitted at one end, nothing fitted at the other end. PL259 plug supplied loose. As supplied with Vehicle Installation Kit.

ORDERING INFORMATION

Stock Code	Description	Weight
QM5021	HF-90M → Vehicle Antenna (4.5m)	0.25kg

4.12.6.2 QM5022 HF-90M → Base Station Antenna (30m)

Description:
BNC connector fitted at one end, PL259 plug fitted to the other end. As supplied with Base Station antennas (Section 4.4).

ORDERING INFORMATION

Stock Code	Description	Weight
QM5022	HF-90M → Base Station Antenna (30m)	1.50kg

4.12.6.3 QM5064 HF-90M → TA-99 (115mm)

Description:
115mm coaxial cable to connect the TA-99 to the HF-90M. Suited to Manpack packages.

ORDERING INFORMATION

Stock Code	Description	Weight
QM5064	HF-90M → TA-99 (115mm)	0.10kg

4.12.6.4 QM5068 HF-90M → TA-90 (320mm)

Description:
320mm coaxial cable to connect the TA-90 to the HF-90M. Suited to integrated vehicle packages.


ORDERING INFORMATION

Stock Code	Description	Weight
QM5068	HF-90M → TA-90 (320mm)	0.10kg

4.12.7 Mains Cables


4.12.7.1 Figure 8 Socket Cables

Mains outlets vary across the globe. Summarised below are the most common mains plugs and the part number for ordering.

Mains End / Equipment End	Type A: Continental Europe	Type B: United Kingdom	Type C: Australia, New Zealand, Argentina	Type D: North America	Type E: India, South Africa
	Order Code: QM5087	Order Code: QM5082	Order Code: QM5081	Order Code: QM5083	Order Code: QM5118

4.12.7.2 IEC Socket Cables

Mains outlets vary across the globe. Summarised below are the most common mains plugs and the part number for ordering.

Mains End / Equipment End	Type A: Continental Europe	Type B: United Kingdom	Type C: Australia, New Zealand, Argentina	Type D: North America	Type E: India, South Africa
	Order Code: QM5085 (0.05kg)	Order Code: QM5086 (0.05kg)	Order Code: QM5084 (0.05kg)	Order Code: QM5119 (0.05kg)	Order Code: QM5120 (0.05kg)

4.12.8 Other Cables

4.12.8.1 QM5051M Programming Cable (with Adaptor)

Description:

2m Programming Cable to connect the HF-90M with a computer serial port. Supplied with DB25 connector and adaptor for DB9 connector. For use with the HF-90M Programming Package (see 4.13.1.1).

ORDERING INFORMATION

Stock Code	Description	Weight
QM5051M	Programming Cable - With adaptor	0.30kg

4.12.9 Miscellaneous Items

4.12.9.1 QM3001 PL259 → BNC Adaptor

In-line adaptor to convert a PL259 fitting to a BNC fitting



ORDERING INFORMATION

Stock Code	Description	Weight
QM3001	PL259 → BNC Adaptor	0.05kg

4.12.9.2 QM4061M Data Interface Unit

Description:

Provides an interface between a HF-90M transceiver and an RF modem. Includes a control port for PTT control and auxiliary microphone/speaker connector.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4061M	Data Interface Unit	1.00kg

4.12.9.3 QM9501M Fan Option (Modular)

Description:

Fits to rear of the HF-90M. Suited to continuous duty base station applications, such as data transmission with the QM9082M. As supplied in Email and Chat Data Package (see 4.5.1).



ORDERING INFORMATION

Stock Code	Description	Weight
QM9501M	Fan Option - Modular	0.07kg

4.13 DEALER SUPPORT PRODUCTS

4.13.1 Programming Software

4.13.1.1 QM1002M HF-90M Programming Package

IBM compatible software package (Windows Operating System) allows programming of the following functions:

- | | |
|--|---|
| <p><i>Standard Model HF-90M:</i></p> <ul style="list-style-type: none"> • Channel/frequency programming • USB/LSB mode toggle enable/disable • Power output setting • Auto-tune enable/disable | <p><i>Advanced Model HF-90M:</i></p> <ul style="list-style-type: none"> • Field programming enable • Selcall ID number • Selcall and scanning on specific channels/frequencies |
|--|---|

Includes:

- Programming Cable (Part No. QM5051M)
- Quick Reference Guide: HF-90M Programming Package

Note:

Package is provided on CD as standard. This programming software is for use on radios with Export Version firmware (HF-90E or HF-90H).



ORDERING INFORMATION

Stock Code	Description	Weight
QM1002M	HF-90M Programming Package	1.00kg

4.13.2 Product Documentation

4.13.2.1 QM1021 HF-90/M Technical Manual

Description:

Detailed manual outlining product specifications, software, maintenance, fault finding and testing.

Note:

Authorised Q-MAC Dealers receive one HF-90/M Technical Manual at no charge with their first purchase of a HF-90 or HF-90M Transceiver. Extra copies must be purchased if required.



ORDERING INFORMATION

Stock Code	Description	Weight
QM1021	HF-90/M Technical Manual	0.35kg

4.13.3 Replacement Modules

4.13.3.1 96005 HF-90M Front Panel Module

Description:

HF-90M front panel module, including front panel PCB.



ORDERING INFORMATION

Stock Code	Description	Weight
96005	Front Panel Module	0.20kg

4.13.3.2 96004 HF-90M PASW Module

Description:

Power amplifier and switch mode power supply module, complete with heatsink assembly.



ORDERING INFORMATION

Stock Code	Description	Weight
96004	HF-90M PASW Module	0.45kg

4.13.3.3 96003 HF-90M RXMP Module

Description:

Receiver and microprocessor module.



ORDERING INFORMATION

Stock Code	Description	Weight
96003	HF-90M RXMP Module	0.15kg

4.13.4 Test Devices

4.13.4.1 QM4085 HF Test Indicator Unit

Description:

Tests HF-90/M radios and provides indications of RF Output Power Present, DC Power on Coax Present and Tune Interrupt Signal Present. Incorporates a dummy load and signal source. Suitable for testing commercial HF-90 or military HF-90M transceivers.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4085	HF Test Indicator Unit	1.00kg

4.13.4.2 QM4082 Antenna Current Meter

Description:

Meter for measuring antenna current in whip antenna system. For use where the antenna coaxial cable carries DC voltage to drive an automatic antenna tuner. This device provides an effective method of determining the performance of antenna systems incorporating antenna tuners that require DC on the coaxial cable e.g. TA-99.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4082	Antenna Current Meter	2.00kg

4.13.4.3 QM4084 DC Blocking Filter

Description:

In line BNC to BNC DC Blocking Filter used when testing the HF-90M with DC Enabled on COAX.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4084	DC Blocking Filter	0.30kg

4.13.4.4 QM4072 Asymmetric T Piece

Description:

Asymmetric T Piece with RF Monitor Point. Used for bench testing the HF-90M in line with antenna. Allows monitoring of output wave form on oscilloscope.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4072	Asymmetric T Piece	0.30kg

4.13.4.5 QM4075 50 Ohm RF Dummy Load

Description:

50 Ohm Dummy Load with QM3001 BNC-PL259 UHF Adaptor.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4075	50 Ohm RF Dummy Load	1.00kg

4.13.4.6 QM4071M Breakout Test Box

Description:

Breakout unit with Audio In, Audio Out and External PTT. Useful for bench testing HF-90Ms.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4071M	Breakout Test Box	0.30kg

4.13.4.7 QM4081M Voice Enunciator Box

Description:

Device to automatically key and modulate a HF-90M transceiver.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4081M	Voice Enunciator Box	1.00kg

4.13.4.8 QM4083 Field Service Tool/Pocket Knife

Description:

Convenient pocket tool suitable for the field assembly and disassembly of HF-90Ms.



ORDERING INFORMATION

Stock Code	Description	Weight
QM4083	Field Service Tool	0.30kg

4.13.5 HF-90 Overhaul Service

4.13.5.1 QM9099M HF-90M Overhaul Service

Includes:

- New front panel keys
- New rotary encoder
- New power switch
- New microphone socket
- New knob and handles
- Thorough clean
- Microprocessor firmware update (to the latest version compatible with the hardware version installed)
- Electronic design change updates (to the latest version compatible with the hardware version installed)
- Re-test
- Repair damaged/suspect components
- Re-alignment
- Labour charges
- Extend warranty for 12 months



Note:

The extended warranty will only apply if the unit has not suffered water damage. Overhaul Service does not apply to radios that have suffered severe irreparable damage and require complete module replacement.

ORDERING INFORMATION

Stock Code	Description	Weight
QM9099M	HF-90M Overhaul Service	2.00kg

4.13.6 Spares Kits

4.13.6.1 QM1044 Spares Kit (Component Level TA-90M)

Description:

Recommended spares for the maintenance of up to 50 TA-90M ATUs for a service period of 2 to 3 years. Also includes HF-90M Vehicle Power Cable, Coax, HV and Ground Cables. Q-MAC recommends that 5 complete TA-90M units are kept as spares in addition to these component spares (not included).



ORDERING INFORMATION

Stock Code	Description	Weight
QM1044	Spares Kit - Component level TA-90M	15.00kg

4.13.6.2 QM1045 Spares Kit (Component Level TA-99)

Description:

Recommended spares for the maintenance of up to 50 TA-99 ATUs for a service period of 2 to 3 years. Q-MAC recommends that 5 complete TA-99 units are kept as spares in addition to these component spares (not included).



ORDERING INFORMATION

Stock Code	Description	Weight
QM1045	Spares Kit - Component level TA-99	5.00kg

4.13.6.3 QM1047 Spares Kit (Component Level HF-90M)

Description:

Recommended spares for the maintenance of up to 50 HF-90M transceivers for a service period of 2 to 3 years. Q-MAC recommends that 5 complete HF-90M units are kept as spares in addition to these component spares (not included).



ORDERING INFORMATION

Stock Code	Description	Weight
QM1047	Spares Kit - Component level HF-90M	10.00kg

4.13.6.4 QM1048 Spares Kit (Component Level ML-90 ATU)

Description:

Recommended spares for the maintenance of up to 50 ML-90 Automatic Antenna Tuners for a service period of 2 to 3 years. Q-MAC recommends that 5 complete ML-90 ATUs are kept as spares in addition to these component spares (not included). This spares package does not include roof rack or antenna element spares.



ORDERING INFORMATION

Stock Code	Description	Weight
QM1048	Spares Kit - Component level ML-90 ATU	15.00kg

5 SALES TERMS AND CONDITIONS

1 Definitions

- 1.1 'Q-MAC' means Q-MAC Electronics Pty Ltd (ACN 054 566 684) of 142 Hasler Road Osborne Park, 6017, Western Australia.
- 1.2 'Customer' means the party which has ordered the goods and to whom the goods will be or have been supplied.
- 1.3 'Goods' means the products or services manufactured and/or supplied by Q-MAC as itemised on the Invoice.
- 1.4 'Invoice' means the document upon which Q-MAC records the details and pricing relating to an order placed by a Customer for the supply of Goods.
- 1.5 'Purchase Price' means the total price identified on the invoice, being for the Goods, and is inclusive of all applicable freight, insurance and documentation charges.
- 1.6 'Agreement' means the agreement between the Customer and Q-MAC for the supply of Goods in accordance with the Sales Terms & Conditions herein.

2 Payment & Ownership of Goods

- 2.1 The Purchase Price must be paid prior to despatch of goods, unless the Customer is granted adequate credit facility by Q-MAC.
- 2.2 For specific large orders, Q-MAC requires a percentage of the Purchase Price as down-payment, prior to proceeding with the Customer's order and subsequent progress payments. In such cases, the balance of the Purchase Price must be paid prior to despatch of Goods, unless an adequate credit facility is granted by Q-MAC.
- 2.3 Ownership title of the Goods remains with Q-MAC until the Customer has paid for the Goods and all applicable freight, insurance and documentation charges in full.
- 2.4 Invoices not paid within the prescribed time frame are subject to a late payment penalty fee of 2% of the outstanding balance per month. Fees are applicable from the first day following the due date.
- 2.5 A Customer may request a credit facility with Q-MAC and will be required to complete a credit application. Q-MAC makes no representation that a credit facility will be granted. Q-MAC may terminate any credit facility by advice in writing at any time at its sole discretion. Credit facilities will be suspended should the Customer fail to pay an account within the terms specified. Suspension shall remain in force at least until the outstanding amount is paid in full.
- 2.6 In the event of the Customer's death, insolvency, bankruptcy, winding up, suspension of payments, dissolution or modification of partnership, non-payment or non-acceptance of any shipment(s) or draft(s), overdue account, etc, Q-MAC may cancel or suspend the order.
- 2.7 Q-MAC always reserves all rights to recover from the Customer any loss occasioned thereby, in addition to any lien to which Q-MAC may by statute or otherwise be entitled. Q-MAC shall also be entitled to a general lien on all property or goods belonging to the Customer in Q-MAC's possession (although such goods or some of them have been paid for) for the unpaid price of any other goods or services sold and delivered to the Customer under any order or request.
- 2.8 Unless otherwise agreed risk shall pass to the Customer upon advice of readiness. Notwithstanding that risk may have passed to the Customer, property and title in any goods shall remain with Q-MAC until receipt by Q-MAC of the price of the goods as invoiced by Q-MAC. Until such time as property and title in the goods passes to the Customer, the Customer shall hold the goods as bailee for Q-MAC.
- 2.9 If the Customer sells the goods to a third party prior to paying Q-MAC the purchase price thereof, Q-MAC shall be entitled to be paid so much of the price paid by the third party as is necessary to satisfy the moneys owing by the Customer. The Customer shall not otherwise in any way part with possession or dispose of the goods until Q-MAC has received payment for those goods.
- 2.10 If the agreement is terminated by Q-MAC, then Q-MAC is entitled to the immediate return of the goods and is authorised to enter any premises to repossess goods stored there. Upon the repossession of the goods, Q-MAC shall be entitled to resell the goods for the best price it can obtain and to be paid by the Customer any and all shortfall between that sale price and the debt owing to Q-MAC, together with the damages suffered by Q-MAC as a result of the default by the Customer. Such damages include, but are not limited to, the legal costs and other expenses incurred in obtaining possession of the goods. The Customer shall have no claim against Q-MAC for any damages or other moneys whatsoever if Q-MAC repossesses or attempts to repossess the goods.
- 2.11 If the contract between the parties or any credit facility is terminated by Q-MAC and invoices remain unpaid, Q-MAC shall be entitled to the immediate return of the goods and is authorised to enter upon the premises of the Customer or any other premises at which the goods are stored to repossess the goods.

3 Delivery

- 3.1 Freight and associated charges will be charged to the Customer. The standard delivery method is airfreight.
- 3.2 Q-MAC utilises INCOTERMS 2000 to describe modes of delivery.
- 3.3 Where the Customer does not agree to Q-MAC's standard delivery arrangement, the Customer must clearly specify in writing their preferred delivery arrangement, utilising INCOTERMS 2000. Q-MAC reserves the right to refuse any such specified delivery arrangement. Alternatively, the Customer may arrange for collection and delivery of Goods at their cost.
- 3.4 Q-MAC will always endeavour to meet the dispatch date as specified by the Customer and agreed by Q-MAC, however Q-MAC will not be held liable for any loss incurred by the Customer as a result of any delay in dispatch.
- 3.5 Where a dispatch is delayed by the Customer, Q-MAC will invoice the Customer for a suitable progress payment.
- 3.6 The Customer must inspect the product immediately upon delivery and must within 24 hours of delivery give written notice to Q-MAC, with full particulars, of any claim that the Product is not in accordance with the confirmed order.
- 3.7 If the Customer does not give that notice, then the Product is deemed to have been accepted by the Customer and the Customer must pay for the Product in accordance with the terms and conditions of this agreement.

4 Cancellation & Termination

- 4.1 If a cancellation is accepted by Q-MAC, cancellation fees will be charged, depending on the work already done to complete the order, at the time when the cancellation is accepted.
- 4.2 Cancellations will not be accepted by Q-MAC for custom items ordered specifically for the Customer, and the full contract value will be charged.
- 4.3 Q-MAC's agreement to continue to deliver or sell shall always be conditional upon it being satisfied of the Customer's ability to pay and comply with these terms and conditions. If Q-MAC suspends and/or terminates deliveries it shall not be liable in any way for any claim, damage, expense, or cost arising there from and all moneys then outstanding by the Customer shall immediately become due and payable.

5 Warranty

- 5.1 Q-MAC warrants all products designed/manufactured by Q-MAC to be free of faults arising from defects in workmanship and/or materials.
- 5.2 In the event that the product is proven faulty within 3 (three) years from the date of shipment ex works, Q-MAC will remedy such fault at no charge to the end user, provided the product is returned to Q-MAC or to one of its Authorised Dealers in accordance with published procedures.
- 5.3 Where an extended warranty has been pre-paid at the time of initial equipment purchase, the prescribed period will be the standard prescribed period plus the period of the extended warranty.
- 5.4 Subject to the terms of this Warranty, no liability (express or implied) is accepted for any consequential loss or damage resulting from a fault in the product. All guarantees (express or implied) concerning quality or fitness for purpose are hereby expressly excluded.
- 5.5 This warranty shall only apply to products designed, manufactured and supplied by Q-MAC.
- 5.6 In all other cases, Q-MAC will make every endeavour to ensure that the end user receives full benefit of any warranty given by third party manufacturers.
- 5.7 This warranty shall not apply to:
 - a. where the product has been subject to abuse or accidental damage.
 - b. where the product has been installed, adjusted or repaired by anyone other than an Authorised Dealer.
 - c. where the product has been installed, operated, adjusted or repaired, other than in accordance with instructions issued by Q-MAC.
 - d. where the serial label attached to the product has been defaced or removed.
 - e. to the distance or terrain over which transceiver products will operate.
 - f. to the quality of transmission or reception as a result of unfavourable environmental conditions.
- 5.8 The company warrants that all batteries supplied by the company will be free from defects in design, workmanship and materials for a period of 6 (six) months from the date of shipment. The liability of the warranty is limited to the resupply or repair providing the fault is reported within 48 (forty eight) hours of the fault occurring. A battery will degrade in performance over time. The company does not warrant the life, performance, charge rate or discharge rate of the battery.
- 5.9 Repairs conducted on warranty items are warranted for 6 (six) months or the balance of the original warranty, whichever is the longer. Repairs conducted on non-warranty items are warranted for 6 (six) months on the fault repaired only.
- 5.10 Items requiring warranty repair or replacement will be subject to approval by Q-MAC. Goods must be suitably packaged for airfreight and be marked "freight pre-paid". Q-MAC will reject any packages sent for warranty repair where the freight has not been pre-paid or goods have been inadequately packaged resulting in freight damage.
- 5.11 Where an item has been returned for repair and found not to be coverable under warranty, Q-MAC will notify the Customer of a repair estimate. Where the Customer elects not to proceed with a repair, a service fee will apply. Q-MAC will also invoice the Customer for the freight of non-warranty items.

6 Export Controls

- 6.1 Where items are subject to export controls of the Australian government, the Customer will be required to complete an end-user declaration. Failure to complete the export application in a timely manner may result in delays to the order dispatch.
- 6.2 Items subject to these controls may not be re-exported.
- 6.3 Where an export application has been refused, suspended, or cancelled due to an Australian government ruling or United Nations sanction, Q-MAC will not be liable for any loss or consequential damages.

7 Copyright

- 7.1 All intellectual property, including but not limited to designs, source code, compiled code, and documentation remain the property of Q-MAC at all times.
- 7.2 Duplication, reverse engineering, or attempts to reverse engineer intellectual property is strictly forbidden.

8 Liability and Indemnity

- 8.1 Q-MAC will not be liable to the Customer, or any other party, for any loss or consequential damages in connection with the provision or use of the Goods.
- 8.2 Force Majeure: Every effort will be made to carry out any contract based on this quotation, however the due performance of it is subject to variation or cancellation owing to an "Act of God", Terrorist acts, war, strikes, lock-outs, fire, flood, drought or any other cause beyond the seller's control, or owing to inability to procure items except at increased prices as a result of any of the foregoing causes.

9 Variation

- 9.1 Q-MAC may vary these Sales Terms & Conditions at any time.

10 Applicable Law

- 10.1 This Agreement should be interpreted in accordance with the laws of Western Australia.

Last revised 13 June 2005

6 LETTERS OF CREDIT

Format acceptable to Q-MAC Electronics Pty Ltd

INCOTERMS 2000

<i>Form of Documentary Credit:</i>	Irrevocable
<i>Date and Place of Expiry:</i>	(90 days after shipment) Australia
<i>Beneficiary:</i>	Q-MAC Electronics Pty Ltd 142 Hasler Road OSBORNE PARK WA 6017 AUSTRALIA
<i>Bank:</i>	BankWest International Trade and Finance Operations PERTH WA
<i>Swift Code:</i>	BKWAAU6P
<i>Amount:</i>	As provided by official Q-MAC quotation
<i>Available with/Available by:</i>	Freely negotiable by any Australia bank
<i>Drafts at:</i>	Sight
<i>Partial Shipments:</i>	Allowed
<i>Transshipment:</i>	Allowed
<i>Loading on Board/Dispatch/ Taking in Charge at/from:</i>	Perth Airport / Fremantle Wharf
<i>For Transportation to:</i>	(destination) Airport / Wharf
<i>Description of Goods or Services:</i>	(as applicable)
<i>Documents Required:</i>	Commercial Invoice Packing List Certificate of Origin Air Waybill / Bill of Lading
<i>Charges:</i>	All charges outside Australia are for the applicants account
<i>Confirmation Instructions:</i>	Confirmation Allowed (Confirmation charges to beneficiary)

Note: Letters of Credit must be issued by a recognised and reputable International Bank acceptable to Q-MAC Electronics Pty Ltd. **A documentation fee of AUD\$350 applies for all Letters of Credit.** Additional fees will be applicable for special documents requiring stamping by embassies, consulates, solicitors, etc.

7 INTERNATIONAL FREIGHT ABBREVIATIONS

Included below are the INCOTERMS 2000 definitions for the most commonly used types of freight used by Q-MAC.

7.1 EX WORKS (EXW)

"Ex works" (EXW) means that the seller delivers when he places the goods at the disposal of the buyer at the seller's premises or another named place (i.e. works, factory, warehouse, etc.) not cleared for export and not loaded on any collecting vehicle. This term thus represents the minimum obligation for the seller, and the buyer has to bear all costs and risks involved in taking the goods from the seller's premises. However, if the parties wish the seller to be responsible for the loading of the goods on departure and to bear the risks and all the costs of such loading, this should be made clear by adding explicit wording to this effect in the contract of sale. This term should not be used when the buyer cannot carry out the export formalities directly or indirectly. In such circumstances, the FCA term should be used, provided the seller agrees that he will load at his cost and risk.

7.2 FREE ON BOARD (FOB)

"Free on Board" (FOB) means that the seller delivers when the goods pass the ship's rail at the named port of shipment. This means that the buyer has to bear all costs and risks of loss of or damage to the goods from that point. The FOB term requires the seller to clear the goods for export. This term can be used only for sea or inland waterway transport. If the parties do not intend to deliver the goods across the ship's rail, the FCA term should be used.

7.3 COST INSURANCE AND FREIGHT (CIF)

"Cost, Insurance and Freight" means that the seller delivers when the goods pass the ship's rail in the port of shipment. The seller must pay the costs and freight necessary to bring the goods to the named port of destination BUT the risk of loss of or damage to the goods, as well as any additional costs due to events occurring after the time of delivery, are transferred from the seller to the buyer. However, in CIF the seller also has to procure marine insurance against the buyer's risk of loss of or damage to the goods during the carriage. Consequently, the seller contracts for insurance and pays the insurance premium. The buyer should note that under the CIF term the seller is required to obtain insurance only on minimum cover'. Should the buyer wish to have the protection of greater cover, he would either need to agree as much expressly with the seller or to make his own extra insurance arrangements. The CIF term requires the seller to clear the goods for export. This term can be used only for sea and inland waterway transport. If the parties do not intend to deliver the goods across the ship's rail, the CIP term should be used.

7.4 CARRIAGE AND INSURANCE PAID (CIP)

"Carriage and Insurance paid to..." means that the seller delivers the goods to the carrier nominated by him, but the seller must in addition pay the cost of carriage necessary to bring the goods to the named destination. This means that the buyer bears all risks and any additional cost occurring after the goods have been so delivered. However, in CIP the seller also has to procure insurance against the buyer's risk of loss of or damage to the goods during the carriage. Consequently, the seller contracts for insurance and pays the insurance premium. The buyer should note that under the CIP term the seller is required to obtain insurance only on minimum cover'. Should the buyer wish to have the protection of greater cover, he would either need to agree as much expressly with the seller or to make his own extra insurance arrangements. "Carrier" means any person who, in a contract of carriage, undertakes to perform or to procure the performance of transport, by rail, road, air, sea, inland waterway or by a combination of such modes. If subsequent carriers are used for the carriage to the agreed destination, the risk passes when the goods have been delivered to the first carrier. The CIP term requires the seller to clear the goods for export. This term may be used irrespective of the mode of transport, including multimodal transport.

7.5 DELIVERED DUTY UNPAID (DDU)

"Delivered duty unpaid" means that the seller delivers the goods to the buyer, not cleared for import, and not unloaded from any arriving means of transport at the named place of destination. The seller has to bear the costs and risks involved in bringing the goods thereto, other than, where applicable, any "duty" (which term includes the responsibility for and the risks of the carrying out of customs formalities, and the payment of formalities, customs duties, taxes and other charges) for import in the country of destination. Such "duty" has to be borne by the buyer as well as any costs and risks caused by his failure to clear the goods for import in time. However, if the parties wish the seller to carry out customs formalities and bear the costs and risks resulting there from as well as some of the costs payable upon import of the goods, this should be made clear by adding explicit wording to this effect in the contract of sale. This term may be used irrespective of the mode of transport but when delivery is to take place in the port of destination on board the vessel or on the quay (wharf), the DES or DEQ terms should be used.

8 DATA SECTION

8.1 HF-90 GOLDEN RULES

- Use of an adequate power supply and cabling is critical to the correct functioning of the HF-90 family of transceivers. Unless adequate current is supplied to the transceiver, poor performance will result.
- Do not attempt to operate the HF-90 directly from a battery charger while the battery is disconnected. Although no damage will occur to the HF-90, it will not operate correctly.
- Using the HF-90 while float charging the battery may reduce the performance of the receiver due to noise generated by the battery charger.
- Always ensure that the power cable connecting the transceiver to the power source is at least the same diameter as that originally supplied with the equipment. If the distance between the transceiver and power supply is increased, then the diameter of the power cable will probably need to be increased also. The greater the distance between the transceiver and the power supply, the heavier gauge of cable required.
- The HF-90 can operate on voltages down to around 10VDC. Receiver performance will remain fairly constant, however the transmit output power will be reduced at voltages lower than 13.8VDC.
- Due to its small size and its high power rating the HF-90 dissipates a significant amount of heat and consequently gets quite hot after extended periods of transmitting. This is normal and not a cause for concern. The radio has been designed to operate with a heatsink temperature (rear of the radio) in excess of 80°C.

8.2 BATTERIES

- Correct use and maintenance of rechargeable batteries is essential to providing trouble-free performance of your portable radio system. Q-MAC supplies different batteries for different applications. The charging requirements vary depending on the type of battery being used.
- Sealed Lead Acid (SLA) batteries require a constant voltage charge and may be recharged at any time in their discharge cycle. e.g. recharge after use. They should not be left in a discharged state for extended periods, (nominal cell voltage = 2V).
- Nickel Cadmium (NiCad) batteries require a constant current charge and should preferably be recharged at the end of their discharge cycle. i.e. recharge after being completely discharged. NiCad batteries are susceptible to "memory effect". This occurs when batteries are recharged before they are fully discharged, decreasing the ability of the cells to accept a charge, therefore reducing the capacity of the batteries, (nominal cell voltage = 1.2V).
- Nickel Metal Hydride (NiMH) is more expensive than NiCad, and can be up to 30% - 40% more capacity than a NiCad battery of the same size and is less susceptible to memory effect. Like NiCad batteries, NiMH batteries prefer a constant current charge, (nominal cell voltage = 1.2V).
- Lithium Ion (Li-Ion) batteries have higher energy density per unit of volume and weight than other battery types (three times as much as NiCad). Li-Ion batteries do not suffer from memory effect. Charging a Li-Ion battery requires a two-stage process - constant current followed by constant voltage - making Li-Ion battery chargers more complex, (nominal cell voltage = 3.6V).
- Lithium Ion batteries are subject to extra freight charges due to dangerous goods classification by IATA.
- Battery chargers are **NOT** universally interchangeable. **ALWAYS** use an approved charger when charging your batteries.
- **SAVE MONEY** by ordering portable packages with the 'b' suffix and purchasing equivalent batteries locally to reduce freight costs! Q-MAC cannot guarantee radio performance on battery life in these instances or that Q-MAC chargers will work with other batteries.

8.3 THE EFFECT OF POWER OUTPUT ON RANGE

There is much misunderstanding on the topic of power output and range achieved by HF communication systems. Two different propagation modes exist for HF communication. These are Skywave and Groundwave.

8.3.1 Groundwave

Field strength on groundwave varies with range and soil type. At close range over dry ground, a 12dB increase in power is required to double the range. At longer range, a 20dB increase in power is required to double the range. Limit range on groundwave can be as little as 10km over sand or as much as 100km over seawater. A change of output power from 50 Watt to 130 Watt is only 4dB and consequently has only a very small effect on achievable range - typically 2%. There is often more than 4dB difference between the efficiencies of different manufacturer's vehicle antenna tuners so that a 50 Watt radio can outperform a 130 Watt radio if the antenna tuner is more efficient.

8.3.2 Skywave

Many users of HF links use Skywave in the 100-500km range. This is considered as NVIS, Near Vertically Incident Skywave, where the signal bounces directly back from the ionosphere. A horizontally polarized antenna is used which has high angle radiation. The received signal is essentially constant over a radius of 500km. The signal to noise ratio is good if the correct frequency is chosen and a 4dB difference in signal level is not detectable. The correct frequency is one a little beneath the CRITICAL frequency, which can be found by studying ionosondes available at www.jps.oz.au. The critical frequency rises to about 9MHz at noon during a sunspot maximum and is as low as 5MHz at noon during a sunspot minimum. Vertical whip antennas on vehicles are not well suited for this mode of operation and are often bent back to increase the horizontal radiation.

For longer distance, communication of 1000km and beyond power becomes a more significant issue. However, 4dB change will not help significantly. At least 10dB increase in power is necessary to make a worthwhile difference. This would mean increasing from 50 Watt to 500 Watt. In fixed station use, the utilization of a beam antenna should be considered for higher frequency long distance working.

8.3.3 Noise

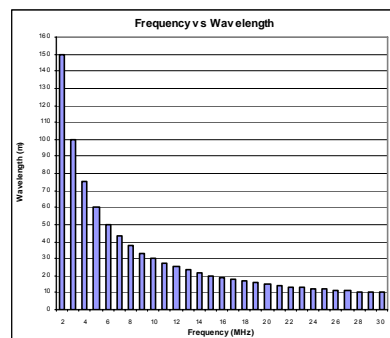
Most HF systems are limited by external noise level if operation is on frequencies below 10MHz. Atmospheric noise due to thunderstorm activity varies by up to 50dB between summer and winter. It is highest in summer and lowest in winter. Man-made power line and other noise can also vary by 50dB, being very severe in urban environments where overhead power lines and computers are present. Relative to a 50dB variation, 4dB change is vanishingly small and so in circumstances where a 50 Watt signal will not get through, a 130 Watt signal will not get through either.

8.4 HF ANTENNA BASICS

Why Do I Need Such A Long Antenna?

The relationship between frequency and wavelength is inversely proportional. That is, the lower the frequency, the longer the antenna. (refer to graph). Generally, antennas that are less than $\frac{1}{4}$ wavelength in length will not perform as effectively - shorter antennas are a compromise between what is practical and what is still effective.

In addition to the various whip antennas, Q-MAC Electronics supplies four different classes of wire antennas. Details of these wire antennas are as follows...



Broadband Dipole

These antennas are balanced antennas and consequently do not depend on a ground connection to form part of the antenna system. They contain elements which terminate the incident wave rendering them essentially broadband. They do not require an antenna tuning unit and work well over short to medium (0-1000km) ranges with moderate elevation (5-10m) and at longer range (>1000km) with higher elevation (20m).

End-fed Broadband

These antennas are unbalanced monopole antennas and a ground connection is a vital part of the antenna system. They contain elements which terminate the incident wave rendering them essentially broadband. They do not require an antenna tuning unit and work well over short to medium (0-1000km) ranges with moderate elevation (5-10m) and at longer range (>1000km) with higher elevation (20m).

Long Wire Antenna

This antenna is frequency conscious and requires both an antenna tuning unit and a good ground connection in order to maximize the radiated power. The length of the wire is typically less than a quarter wavelength and a variable inductor within the antenna tuner is used to add effective length to the wire. If ground conductivity is poor, a wire "counterpoise" can be used as an alternative to a ground connection.

Whip Antenna

This is a special case of the Long Wire Antenna where the wire is replaced by a short rod. For a Manpack Package, the user's body, or the ground on which the Manpack rests, forms the ground system. As a result of the poorer ground and shorter antenna length, the performance of whip antennas is significantly less than wire antennas.

8.5 PRACTICAL HF ANTENNA PERFORMANCE

The following distances should be indicative with respect to Q-MAC Manpack antenna systems. In each instance, it is assumed that the Manpack is communicating with a base station utilising a QM7002 Broadband Dipole Antenna or similar wire antenna.

Product Code	Description	Groundwave	Skywave
Manpack Antenna Requiring Tuners			
QM7301 and QM7303	6 and 8 section collapsible whip antenna	5-10km max	150-600km
QM7301 & QM7351	6-section collapsible whip antenna used in conjunction with Extender coil	5-10km max	Not suited to skywave
QM7302	2-section collapsible whip antenna	2-5km max	150-400km
QM7310	Long wire antenna kit	5-30km max	150-1000km
Antenna Not Requiring Tuner			
QM7005	Portable Broadband Antenna	5-30km max	150-1000km

The above distances are of course subject to correct deployment of the antenna systems in question, frequencies in use, time of day, propagation conditions etc. **They are only indicative.** Refer to the tables below.

Effective Short Range Communication (Groundwave) is Dependent On:

- Frequency used: - Lower frequency provides greater distance
- Conductivity of terrain: - Less conductivity provides less distance (e.g. <5km over very dry land)
- High conductivity provides greater distance (e.g. 100km+ over sea)
- Noise floor of frequency used: - Increased noise reduces usability

The overriding factor for effective communications via groundwave is the conductivity of the terrain.

Effective Long Range Communication (Skywave) is Dependent On:

- Frequency used: - Shorter distance covered using lower frequency
- Longer distance covered using higher frequency
- Time of day: - A given frequency covers greater distance at night
- Season: - A given frequency covers greater distance during winter months
- Time in sunspot cycle: - A given frequency covers less distance during high sunspot activity
- Noise floor of frequency used: - Increased noise reduces usability

The overriding factor for effective communications via skywave is the appropriate selection of frequency.

8.6 Q-MAC AUTOMATIC ANTENNA TUNERS

Installation

Most Q-MAC automatic antenna tuners rely on being powered by the DC voltage on the RF coaxial cable from the transceiver. This provides a more efficient method of installation by reducing the interconnecting cables in the radio system.

Testing

If a technician is required to test the operation of the antenna system containing a Q-MAC automatic antenna tuner, then it is recommended that an Antenna Current meter (QM4082 Antenna Current Meter) is used instead of a VSWR meter. Attempting to use a VSWR meter will block the DC voltage from the HF-90 transceiver therefore preventing the tuner from functioning.

8.7 USEFUL HF PROPAGATION WEBSITES

Australian Government:

IPS Radio and Space Services: www.ips.oz.au

Solar Terrestrial Dispatch:

Near Real Time Maximum Usable Frequency (MUF) Map: www.spacew.com/www/realtime

Near Real Time Critical Frequency Map: www.spacew.com/www/fof2

9 PRODUCT INDEX

Part No.	Product Description	Weight (kg)	Page
95312	ML-90/ML-91 Replacement Antenna Element - Replacement for damaged Folding Antenna Element	5.00	32
95319	ML-90 Replacement Wind Deflector	10.00	32
96003	RXMP Module	0.15	53
96004	PASW Module - For HF-90M	0.45	53
96005	Front Panel Module - For HF-90M	0.20	52
96050	VHF-90M Radio Frequency Module	0.30	17
96051	VHF-90M Power Amplifier Module	0.30	18
96052	VHF-90M DSP Module	0.30	18
97753	VHF-90M Display Module	0.30	18
97754	VHF-90M Rear Panel Module	0.30	18
MX9000	HF-90M Ultra-Light Manpack 8.8AH Li-Ion	5.00	20
MX9011	HF-90M Monoblock Manpack 7AH	11.00	21
MX9011b	HF-90M Monoblock Manpack 7AH - No Battery	9.00	21
MX9011c	HF-90M Monoblock Manpack 8.8AH Lithium	10.00	21
MX9015	HF-90M Mil-Std Vehicle Package	15.00	23
MX9015i	MF-90M Mil-Std Integrated Vehicle Package	15.00	23
MX9019	HF-90M Base Package	42.00	25
MX9024	HF-90M High Powered 500 Watt Base Station Package - Complete	65.00	26
MX9027	HF-90M NVIS Roof Rack Antenna - Fixed TXCVR	110.00	22
MX9027b	HF-90M Short NVIS Roof Rack Antenna - Fixed TXCVR	100.00	22
MX9115	HF-90M Mil-Std 150 Watt Vehicle Package	20.00	24
MX9700	VHF-90M Manportable Package - Front Mounting	2.50	5
MX9700R	VHF-90M Manportable Package - Front Mounting; Minus Transceiver	2.50	6
MX9715	VHF-90M Vehicle Package with VDS-50M and VHF-50M 50 Watt Amplifier	10.00	6
MX9716	VHF-90M Vehicle Package 5 Watt with VDS-50M	7.00	7
MX9720	VHF-90M Base Station Package with VHF-50M 50 Watt Amplifier	20.00	8
QM1002M	HF-90M Programming Package and Cable	1.00	52
QM1007M	VHF-90M Programming/Configuration/Cloning Software & Cable	1.00	17
QM1021	HF-90/M Technical Manual	0.35	52
QM1027	VHF-90M Technical Manual	0.35	17
QM1044	Spares Kit -Component Level TA-90	15.00	55
QM1045	Spares Kit -Component Level TA-99	5.00	56
QM1047	Spares Kit -Component Level HF-90M	10.00	56
QM1048	Spares Kit -Component Level ML-90 ATU Unit	15.00	56
QM2101	TA-99 MIL-STD Auto Tuner	0.90	36
QM2150M	Military Vehicle Antenna Upgrade	5.00	23
QM2160	Upgrade ML-90 Tuner to ML-91 125 Watt Capable Tuner	1.00	22
QM3001	BNC/PL259 Adaptor	0.05	51
QM4006M	DTMF Commercial Pedestal Microphone - With Military Connector	1.00	47
QM4014	Military Handset DTMF MIL-STD	0.45	48
QM4016	Military Handset No DTMF MIL-STD	0.45	48
QM4017M	Military Handset No DTMF with Digital Encryption	0.45	48

Part No.	Product Description	Weight (kg)	Page
QM4023M	External Mount Speaker - Rugged Military Grade	1.00	47
QM4025M	External Mount Speaker - Rugged Military Grade with DSP Noise Reduction	1.00	47
QM4026	Upgrade from Standard Speaker to DSP Noise Reduction Speaker	0.00	25
QM4042M	Headphones - Military Grade, Military Connector	0.45	46
QM4051M	CW Option and Telegraph Key - Military Version	1.00	47
QM4061M	HF-90M Data Interface Unit - Military Connector	1.00	51
QM4071M	Break Out Unit	0.30	54
QM4072	Asymmetric T Piece	0.30	54
QM4075	RF Dummy Load	1.00	54
QM4081M	Voice Enunciator Box - Military Connector	1.00	54
QM4082	Antenna Current Meter	2.00	53
QM4083	Field Service Tool	0.30	55
QM4084	DC Blocking Filter	0.30	54
QM4085	HF-90/M Field Test Unit	1.00	53
QM4716	VHF-90M H250U Handset	0.45	14
QM4717	VHF-90M H250U Handset with DTMF	0.45	13
QM4723M	External Mount Speaker - Suits VHF-90M Vehicle Systems	1.00	14
QM4743	VHF-90M Headset with PTT - Light Weight Tactical	1.00	14
QM4744	VHF-90M Headset with PTT	1.00	14
QM4745	Combat Helmet with Integral Audio Headset	4.00	48
QM4772M	VHF-90M Desktop Interface Unit	1.00	18
QM4775M	VHF-90M Bluetooth Adaptor Option for VHF-90M Battery	0.50	5
QM4775MV	Bluetooth Upgrade Option for VHF-90M (added to the VDS Unit)	0.50	6
QM5001M	Power Supply Lead - HF-90M	2.00	49
QM5007M	DC Power Cable for VHF-90M Battery Charge Controller	1.00	12
QM5008M	VHF-90M Tactical Field Rebro Cable	2.00	9
QM5021	Coaxial Cable (4.5m)	0.25	49
QM5022	Coaxial Cable (30m)	1.50	50
QM5051M	Programming Cable c/w Adaptor - Military Connector	0.30	51
QM5059	Cable from ML-90 ATU to Ground	1.00	32
QM5062	High Voltage Cable from ML-90 to Antenna	1.00	32
QM5064	TA-99 to HF-90(M) Coaxial Cable	0.10	50
QM5068	TA-90M to HF-90M Coaxial Cable	0.10	50
QM5076	Cable from ML-90 ATU to Feed Box	1.00	32
QM5078	ML-90 DC Feed Adaptor Cable - Cable to connect old version HF-90s (without DC feed on antenna socket) to current model ML-90	0.30	32
QM5078-Q	ML-91 Control Cable - Cable to connect transceiver to ML-91 ATU Suitable for use with Q-MAC transceiver	0.50	33
QM5078-B	ML-91 Control Cable - Cable to connect transceiver to ML-91 ATU Suitable for use with Barrett transceiver	0.50	33
QM5078-C	ML-91 Control Cable - Cable to connect transceiver to ML-91 ATU Suitable for use with Codan transceiver	0.50	33
QM5078-I	ML-91 Control Cable - Cable to connect transceiver to ML-91 ATU Suitable for use with Icom transceiver	0.50	33
QM5081	AC Mains Cable 2 PIN IEC Type C (Australia, NZ, Argentina)	0.10	50
QM5082	AC Mains Cable 2 PIN IEC Type B (UK)	0.10	50
QM5083	AC Mains Cable 2 PIN IEC Type D (North America)	0.10	50
QM5084	AC Mains Cable 3 PIN IEC Type C (Australia, NZ, Argentina)	0.10	50

Part No.	Product Description	Weight (kg)	Page
QM5085	AC Mains Cable 3 PIN IEC Type A (Continental Europe)	0.10	50
QM5086	AC Mains Cable 3 PIN IEC Type B (UK)	0.10	50
QM5087	AC Mains Cable 2 PIN IEC Type A (Continental Europe)	0.10	50
QM5118	AC Mains Cable 2 PIN IEC Type E (India and RSA)	0.10	50
QM5119	AC Mains Cable 3 PIN IEC Type D (North America)	0.10	50
QM5120	AC Mains Cable 3 PIN IEC Type E (India and RSA)	0.10	50
QM5130	VDS-90M → Misc Power Source (4.5m)	2.00	15
QM5122	VHF-50M → Misc Power Source (4.5m)	2.00	15
QM5125-2.0M	VHF-50M → VDS-90M Control Cable (3m)	2.00	15
QM5107	Coax Cable VDS-50M → Vehicle Antenna (4.5m)	0.25	15
QM5126-30M	Coax Cable VHF-50M → Base Station Antenna (30m)	2.00	15
QM5126-4.5M	Coaxial VHF-50M → Vehicle Antenna (4.5m)	0.25	16
QM5700M	VHF-90M Radio Programming Cable - RS232	0.50	5
QM5701M	VHF-90M to VHF-90M Cloning Cable	0.50	5
QM6000	Ultra-Light Backpack for Monoblock	1.00	45
QM6006	Military Grade - All Welded Backpack Frame	9.00	45
QM6017	Pelican 1250 Case	0.80	45
QM6052M	HF-90M Vehicle Installation Kit (Advanced)	1.30	46
QM6061	Mounting Cradle	0.35	46
QM6063	Mounting Cradle for HF-90M on TA-90M	1.00	46
QM6071M	TA-90 Mounting Kit	2.45	34
QM6700	VHF-90M Canvas Holster - Front Mounting	1.00	13
QM7001	Fixed Broadband Dipole Antenna - Single Wire	3.00	38
QM7002	Fixed Broadband Dipole Antenna - Multi Wire	12.00	38
QM7003	Fixed Broadband Dipole Antenna - Multi Wire - 1000 Watt Voice 500 Watt Data Includes Halyard Kit	18.00	39
QM7004	Terminated Folded Dipole Antenna	6.00	39
QM7005	Portable Broadband Antenna (Standard)	1.25	36
QM7021	Halyard Kit	0.60	40
QM7022	Fixed Broadband Dipole Antenna - Mast Kit	13.00	38
QM7023	Surge Arrestor for High Powered Base Station	10.00	39
QM7024	Surge Arrestor for Integrated Base Station	10.00	39
QM7112M	TA-90M Auto-tune Antenna System (12V)	10.00	34
QM7112Ma	TA-90M Auto-tune Antenna System (24V)	10.00	34
QM7113	ML-90 Auto-tuning Antenna System (Rack and Tuner)	105.00	32
QM7113b	ML-90 Auto-tuning Antenna System Short Size 1.5m(L) x 1.25m(W)	90.00	32
QM7114-Q	ML-91 Auto-tuning Antenna System Standard Size 1.8m(L) x 1.25m(W) Suitable for use with Q-MAC transceiver	105.00	33
QM7114-B	ML-91 Auto-tuning Antenna System Standard Size 1.8m(L) x 1.25m(W) Suitable for use with Barrett transceiver	105.00	33
QM7114-C	ML-91 Auto-tuning Antenna System Standard Size 1.8m(L) x 1.25m(W) Suitable for use with Codan transceiver	105.00	33
QM7114-I	ML-91 Auto-tuning Antenna System Standard Size 1.8m(L) x 1.25m(W) Suitable for use with Icom transceiver	105.00	33
QM7114b-Q	ML-91 Auto-tuning Antenna System Compact Size 1.5m(L) x 1.25m(W) Suitable for use with Q-MAC transceiver	95.00	33
QM7114b-B	ML-91 Auto-tuning Antenna System Compact Size 1.5m(L) x 1.25m(W) Suitable for use with Barrett transceiver	95.00	33
QM7114b-C	ML-91 Auto-tuning Antenna System Compact Size 1.5m(L) x 1.25m(W) Suitable for use with Codan transceiver	95.00	33
QM7114b-I	ML-91 Auto-tuning Antenna System Compact Size 1.5m(L) x 1.25m(W) Suitable for use with Icom transceiver	95.00	33

Part No.	Product Description	Weight (kg)	Page
QM7121M	TA-90M Tuner - Military Grade (12V Version)	2.40	34
QM7121Ma	TA-90M Tuner - Military Grade (24V Version)	2.40	34
QM7122	ML-90 Antenna Tuning Unit Only	4.50	32
QM7123	ML-90 Antenna Feed Box	1.50	32
QM7125	ML-91 Antenna Tuning Unit Only	4.50	33
QM7134M	Military HF Vehicle Antenna Elements - 4 Sections	3.00	34
QM7137	Pair 60mm C-Clamps	0.30	34
QM7138M	Military HF Antenna Base (Suit QM7134M)	3.00	35
QM7139M	Military HF Antenna and Base Combination	6.00	35
QM7171M	Military VHF Vehicle Base and Antenna Combination	6.00	10
QM7172M	Military VHF Antenna Base - No Antenna (Suit QM7170M)	3.00	10
QM7174M	Military VHF Antenna Elements (2 sections)	2.00	10
QM7301	Collapsible Whip Antenna (6 section)	0.30	36
QM7302	Collapsible Whip Antenna (2 section)	0.20	37
QM7303	Collapsible Whip Antenna (8 section)	0.30	10
QM7304	Collapsible Whip Antenna (4 section)	0.20	10
QM7305	Tape Whip Antenna	0.20	37
QM7307M	VHF-90M Flexible Rubber Antenna	0.50	10
QM7310	Long Wire Antenna Kit	0.45	38
QM7351	Antenna Extender Coil Section	0.20	37
QM7601M	TA-90M Upgrade from 12V to 24V Version	0.00	23
QM7702M	VHF 30-88MHz Base Station Discone antenna	5.00	11
QM7821	Antenna Angle Adaptor	0.10	37
QM7921M	TA-91 High Power Vehicle Auto Antenna Tuner (24V Version)	5.00	35
QM8000M	AC Mains Lithium Battery Charger (4A) to Suit Military Batteries	1.50	43
QM8007M	AC Mains Adaptor and Dual Battery Charge Controller - for VHF-90M Batteries	1.30	11
QM8010	Lithium Ion Replacement Battery Cell Pack	1.00	42
QM8011	Rechargeable Battery (7Ah)	2.55	21
QM8020M	Fold-up Solar Panel Charger (Lithium Only)	1.50	43
QM8021	Fold-up Solar Panel Charger (SLA Only)	1.30	43
QM8021M	Fold-up Solar Panel Charger to suit Military Radio Connector	1.30	43
QM8022M	AC Mains Charger 2A Fast Charger (Military Connector) for 7Ah SLA Battery	1.00	43
QM8024M	Step-Up Battery Charging Device to suit Military - SLA Battery	0.30	44
QM8024ML	Step-Up Battery Charging Device to suit Li-Ion Batteries	0.50	44
QM8035M	Hand Crank Generator (c/w tree strap and tripod) - Suits HF-90M	2.70	13
QM8051M	Battery Condition Monitor to suit Military Radio Connector	0.10	44
QM8100	MIL-STD 8.8AH Lithium Ion Battery Pack	1.50	41
QM8100b	MIL-STD 8.8AH Lithium Ion Battery Enclosure Only	0.50	42
QM8101	MIL-STD 7AH SLA Battery	3.50	41
QM8101b	MIL-STD 7AH SLA Battery Enclosure Only	1.00	41
QM8110	MIL-STD 17.6AH Lithium Ion Battery Pack	2.50	42
QM8110b	MIL-STD 17.6AH Lithium Ion Battery Enclosure Only	1.00	42
QM8700M	VHF-90M 12V DC NiMH Battery Pack 2.4AH	0.50	12
QM8723M	AC Mains Supply to Suit VHF-90M Charge Controller	1.00	12
QM8725M	VHF-90M Charge Controller Only - Needs Source	1.00	11
QM8735M	VHF-90M Dual Battery Adapter for Solar and HCG Chargers	0.50	13

Part No.	Product Description	Weight (kg)	Page
QM9056	Advanced Option #6 Upgrade for HF-90M	0.20	31
QM9059	Advanced Option #9 Upgrade to DTMF Pedestal Mic+Gooseneck	0.50	31
QM9061	Frequency Hopping Option (Factory Fitted) 5 Hops/sec	0.05	30
QM9062	Frequency Hopping Upgrade (suits late model HF-90) 5 Hops/sec	0.15	30
QM9065M	Digital Encryption Option (Handset Option)	0.20	30
QM9080C	Field Data Terminal - Crypto Option	0.01	27
QM9080G	Field Data Terminal - GPS Option	0.50	27
QM9080M	Field Data Terminal	1.50	27
QM9080P	Field Data Printer	1.50	27
QM9082M	Email/Chat/Data Package - Military Data Interface Unit	4.00	27
QM9087M	Secure Tactical Workstation	10.00	28
QM9090M	Custom Option - HF-90M Power Reduction to 20 Watts	0.01	29
QM9091M	Custom Option - HF-90M 3Khz Filter for Data Transmission	0.01	29
QM9099M	HF-90M Overhaul Service	2.00	55
QM9101	HF-90M Transceiver - MIL-STD 810F	1.55	29
QM9201M	HF Amplifier 150 Watt	6.50	35
QM9501M	Fan Option (modular) (Military Connector)	0.07	51
QM9700	VHF-90M Transceiver	1.00	9
QM9705M	VHF-50M 50 Watt Vehicle/Base Booster Amplifier Unit	5.00	7
QM9751	Advanced Option DTMF Upgrade	0.20	5
QM9755	VHF-90M Data Transmission Option	0.05	9
QM9756	VHF-90M Data Application for Windows PC or Pocket PC	0.05	9
QM9761	VHF-90M Hopping/Encryption/FCS	0.05	5