

SPECIFICATION SHEET

NAVIGATIONAL & MET EQUIPMENTS

Navigation & met equipments.

I-COM IC-A110 TRANSCEIVER



VHF AIR BAND TRANSCEIVERS

IC-A110 IC-A110EURO

Rugged
MIL-STD 810



Rugged and reliable for serious ground crew communications

Setting a new standard for ground based communications, the IC-A110 /EURO provide durability and reliability in demanding operational environments.

● **Capable of being installed in any vehicle**

IC-A110/EURO are adaptable to vehicles working on a 12 V, as well as a 24 V power source.

● **Front mounted loud speaker**

A loud speaker mounted in the front of the transceiver is free of any obstacles blocking audio reproduction. And 10 W, of powerful output power is available for the external speaker.

● **Dial selection**

With a simple rotation of the dial, frequently used memory channels, or desired frequency selection can be made.

● **Memory channel name capability**

Up to 7-character memory names can be assigned for each channel. Allows simple and quick channel recognition and selection.

● **Side tone function**

Operator's transmitted messages and calls are audio modulated and can be heard by standard airband headsets*, even in the most demanding operating airport conditions.

*Option OPC-871 is necessary when using standard type headset.

● **Convenient on hook scan functions**

Hanging the microphone on the mic. hanger activates the auto scan function. When released, the transceiver will return to the last used, or priority channel, depending on the selection.

● **Usable in extreme cold**

The adopted LCD guaranteed usable in temperatures from -30°C to $+70^{\circ}\text{C}$ (-22°F to $+158^{\circ}\text{F}$). Normal performance, as well as display indications, are guaranteed even in extremely cold areas.

Icom Inc.



ADDITIONAL FEATURES

- Additional to the predominantly used 25 kHz channel spacing, an extra version complying to new regulations is available for 8.33 kHz channel spacing
- Equipped EEPROM system provides maintenance free memory backup capability, without the use of a separate backup battery
- Various scan functions, such as VFO and priority scans are available
- Limited number of keys for simple manipulation, but providing advanced multi-functions

- A total of 20 memory channels are available
- Ideal compact size of 150(W)×50(H)×180(D) mm* to mount in various types of vehicles
*5²⁹/₃₂(W)×1³¹/₃₂(H)×7³²/₃₂(D) in
- 36 W (pep) of powerful output
- Excellent durability to cope with even the toughest workplace
- Memory channel only operation possible via PC programming
- Hand microphone supplied

SPECIFICATIONS

GENERAL

- Frequency range : 118.000–136.975 MHz
- Channel spacing : 8.33/25 kHz auto selection (according to version)
- Mode : 6K00A3E (AM)
- No. of memory Ch. : 20
- Antenna connector : SO-239 (50 Ω)
- Power supply requirement: (negative ground)
13.75 V DC or 27.5 V DC automatic selection
- Current drain (at 13.75 V DC):
Transmitting : 5.0 A max.
Receiving : 4.0 A (at AF max.)
0.5 A (at stand-by)
- Operating temperature range:
IC-A110 : –30°C to +60°C
 : –22°F to +140°F
IC-A110EURO : –20°C to +55°C
- Frequency stability :
IC-A110 : ±5 ppm (–30°C to +60°C)
IC-A110EURO : ±1 ppm (0°C to +40°C)
- Dimensions : 150(W)×50(H)×180(D) mm (projections not incl.)
5²⁹/₃₂(W)×1³¹/₃₂(H)×7³²/₃₂(D) in
- Weight (approx.) : 1.5 kg; 3 lb 5 oz

Measurements made in accordance with RTCA D0-186a (Class C/E, Class 4/6) or EN 300 676. All stated specifications are and subject to change without notice or obligation.

*These specification items are not available for the IC-A110 due to approval test specifications.

Type approval for the IC-A110/EURO varies between countries. Ask your dealer for availability.

TRANSMITTER

- Output power : 36 W typ. pep (9 W typ. for CW)
- Modulation limiting : 70–100% (IC-A110)
- Modulation compression: Linear 85%
Max. 95%
- AF harmonic distortion : Less than 10% (at 85% mod.)
- Hum and Noise ratio : More than 40 dB
- Spurious emissions :
IC-A110 : Less than –16 dBm
IC-A110EURO : Less than –46 dBm
9 kHz to 1 GHz (Less than –36 dBm for harmonics in 30 MHz to 1 GHz range)
1–4 GHz : Less than –40 dBm (Less than –30 dBm for harmonics)
- Adjacent Ch. power* : Less than 60 dB (25 kHz)
Less than 50 dB (8.33 kHz)
- Microphone connector : 8-pin modular (600 Ω)

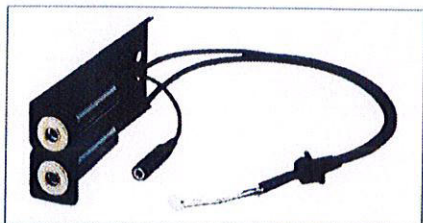
RECEIVER

- Receiving system : Double conversion super-heterodyne
- Intermediate freq. : 1st 38.85 MHz
2nd 450 kHz
- Sensitivity (pd) :
IC-A110 : Less than 1 μV (at 6 dB S/N)
IC-A110EURO : Less than +5 dBμV (at 12 dB SINAD)
- Squelch sensitivity (pd; at threshold):
IC-A110 : Less than 0.3 μV
IC-A110EURO : Less than –6 dBμV
- Selectivity :
25 kHz Ch. spacing : More than ±8 kHz (at –6dB)
Less than ±17 kHz (at –40dB)
Less than ±25 kHz (at –60dB)
8.33 kHz Ch. spacing : More than ±2.778 kHz (at –6dB)
Less than ±7.37 kHz (at –60dB)
- Spurious response : More than 74 dBμ (IC-A110)
More than 70 dB (IC-A110EURO)
- Intermodulation rejection ratio*: More than 64 dB
- Blocking/desensitisation*: More than 70 dB
- Cross modulation rejection*: More than 70 dB
- Audio output power (at 13.75 V; 10% dist.; 60% mod.):
Internal speaker : 1.5 W typical w/8 Ω load
External speaker : More than 10.0 W w/8 Ω load
Headset (side tone) : More than 0.1 W w/500 Ω load
- AF output impedance : EXT SP 8 Ω
Headset (side tone) 500 Ω

Supplied Accessories

- Hand microphone, HM-161
- DC power cable
- Mounting bracket kit
- Microphone hanger kit
- Fuses

OPTION



OPC-871 HEADSET ADAPTER

For connection with standard airband headset.



HM-161 HAND MICROPHONE

Same as supplied.

Applicable U.S. Military Specifications

Icom makes rugged products that have been tested to and passed the following MIL-STD requirements and strict environmental standards.

Standard	MIL 810 C		MIL 810 D		MIL 810 E	
	Method	Proc.	Method	Proc.	Method	Proc.
Low Pressure	500.1	I	500.2	I, II	500.3	I, II
High Temp.	501.1	I	501.2	I, II	501.3	I, II
Low Temp.	502.1	I	502.2	I, II	502.3	I, II
Temp. Shock	503.1	I	503.2	I	503.3	I
Solar Radiation	505.1	I	505.2	I	505.3	I
Rain	506.1	I, II	506.2	I, II	506.3	I, II
Humidity	507.1	I, II	507.2	II, III	507.3	II, III
Salt Fog	509.1	I	509.2	I	509.3	I
Dust	510.1	I	510.2	I	510.3	I
Vibration	514.2	VIII, X	514.3	I	514.4	I
Shock	516.2	I, II, IV	516.3	I, IV	516.4	I, IV

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Your local distributor/dealer:

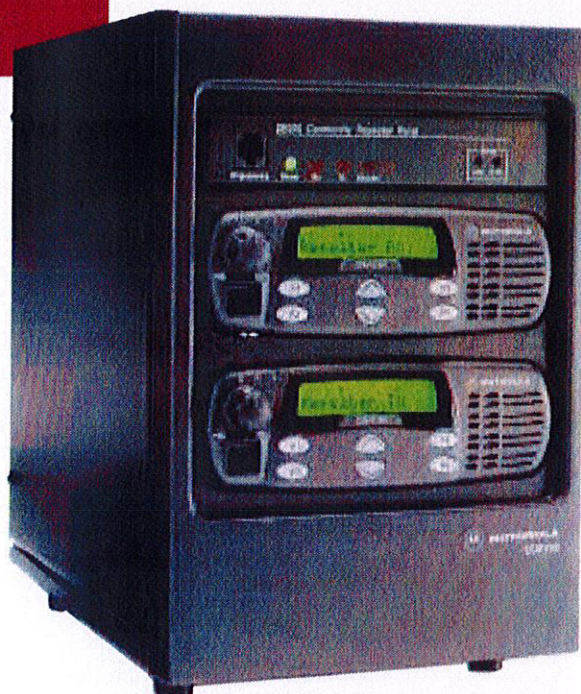


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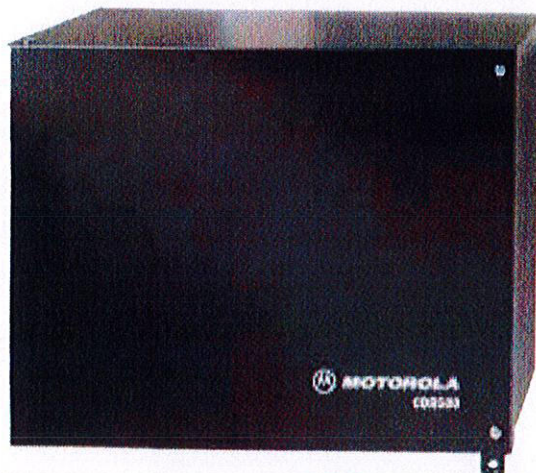
CDR 700 DESKTOP REPEATER STATION



MOTOROLA
intelligence everywhere



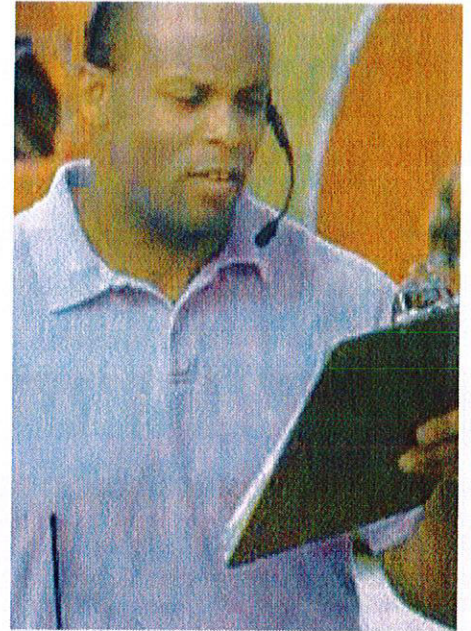
*MOTOROLA CDR500 AND CDR700 REPEATERS
THE SMART WAY TO EXTEND YOUR TWO-WAY*



CDR500 AND CDR700 DEDICATED

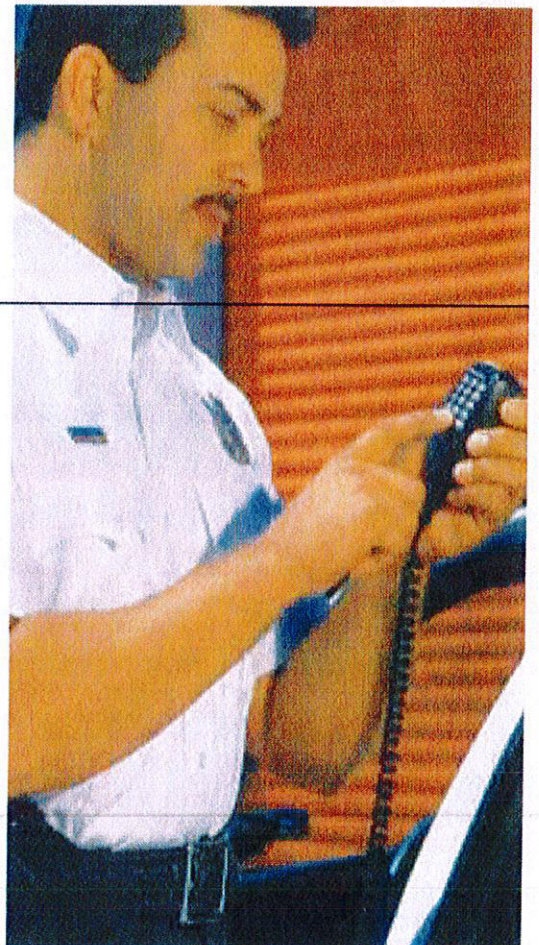
MOTOROLA TWO-WAY RADIOS- QUALITY YOU CAN COUNT ON

Smart professionals in every business know that reliable communication is essential to success. Whether you're in the office or on the road, you need fast, dependable access to the right people and information so you can get the job done. And that's exactly what two-way radio delivers. Efficient two-way radio lets you talk with one, ten, or one hundred people at the touch of a button—without costly airtime charges. Two-way radio provides the individual and team contact you need to maximise productivity and meet your customers' demands—the first time and every time.



TAKING YOUR BUSINESS COMMUNICATION THE EXTRA MILE

As your business grows and changes, your communication requirements expand as well—requiring quicker, more flexible communication tools that can go as far and fast as you do. The Motorola CDR500 and CDR700 repeaters provide the perfect solution. By making it easy to extend your two-way system to accommodate longer distances, these repeaters let you widen the reach of your radios as you broaden your customer base.



UNIQUE VERSATILITY AND POWER

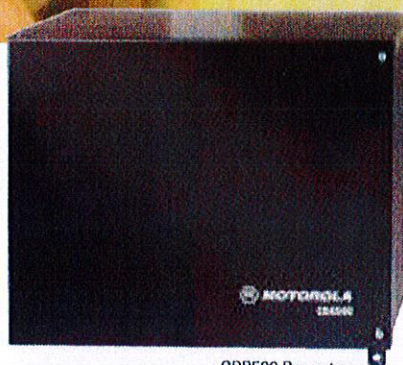
Both the Motorola CDR500 and CDR700 repeaters offer extensive functionality and power to help you increase the calling range and capabilities of your mobile or portable radios—so you can enhance on-the-job efficiency. By receiving and resending radio transmissions these powerful repeaters help you extend your communication range and maintain clear sound quality. Available in lowband, UHF, and VHF frequencies, the Motorola CDR500 and CDR700 repeaters suit a wide variety of applications and can be easily integrated with your existing infrastructure.



CDR500 AND C



CDR700 Repeater



CDR500 Repeater

EXCEPTIONAL BENEFITS

The Motorola CDR500 and CDR700 repeaters delivers valuable benefits, including:

- **Remarkable flexibility** that allows you to choose the frequency and power levels best for your business—or combine two frequencies to create a bidirectional or crossband repeater.
- **The Motorola CDR500 offers a variety of mounting options** to suit your location and usage needs. It can be installed in a 19" rack or mounted on the wall with a handy, lockable wall mount.
- **The Motorola CDR500 desktop model offers sleek, compact design** that compliments any office decor—and allows quick and easy access for system adjustments.
- **Reliable, cost-effective 15A continuous duty power supply** that allows selection of either thermal-controlled or continuous operation of the fan for quiet performance and enhanced efficiency on the Motorola CDR700 model.

Don't wait to take your business communication to the next level. Call your Motorola representative today to ask about the Motorola CDR500 and CDR700 repeaters. It's the smart way to extend your two-way.

MOTOROLA - A NAME YOU KNOW AND TRUST

For more than 65 years, Motorola has been a leader in creating state-of-the-art wireless communication for people like you—and the Motorola CDR500 and CDR700 repeaters uphold that superior standard. Each Motorola component is backed by a limited two-year* warranty on parts and labour. So when you select the Motorola CDR500 and CDR700 repeaters, you'll experience the same exceptional quality and service you've come to expect from all Motorola products.

* Motorola Original radio accessories are covered by Motorola's one-year accessories warranty.



CDR700 REPEATERS

FLEXIBILITY

The Motorola Original Accessories available for your Motorola CDR500 and CDR700 repeaters help you expand and customise your system to meet your business needs.

Controllers - offer you a range of options to accommodate your market and application requirements. A unidirectional configuration provides added range for radios on widespread worksites. A bidirectional configuration can temporarily join two separate groups during critical situations. Unidirectional crossband provides the capability to monitor frequencies such as weather or road condition channels, and bidirectional crossband can temporarily join two groups that normally operate on different frequency bands.

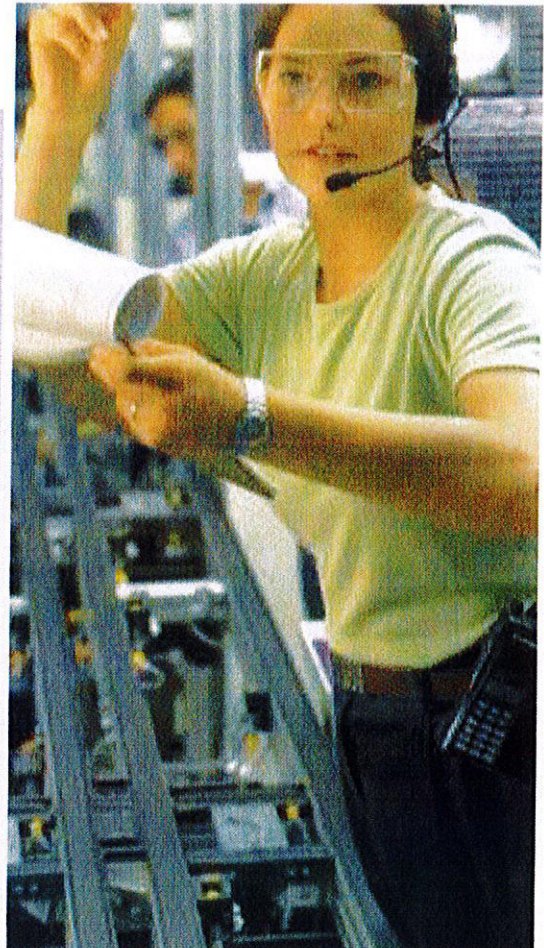
Duplexers - let you use just one antenna for both transmitting and receiving signals. The use of a duplexer is more cost effective than two antennas and feed lines, and can better equalise the transmit and receive ranges to improve radio communications.

Mounting Accessories - are available for the Motorola CDR500 such as a mounting plate which allows the repeater to be installed in a 19" rack. For wall-mounting, an optional mounting plate is also available.

Battery Revert Module - is available for the Motorola CDR700 (standard in the Motorola CDR500).

Antennas - are available to offer you flexibility in size and calling range.

Radio Accessories - including a compact desktop microphone, are available for dispatch applications. External speakers are available for use in noisy environments.



CRD500 and CRD700 Specification*

Frequency Rang	Radio Dependant
Dimensions	(H x W x D)
CRD500	7.5" x 17.5" x 13.5" (191mm x 445mm x 343mm)
CRD700	12.2" x 8.3" x 12.5" (310mm x 211mm x 318mm)
Weight	
CRD500	47 lbs. (21.3 Kg)
CRD700	28.3 lbs. (12.8 Kg)
Duty Cycle	Continuous Low Power 25W (to duplexer) Intermittent High Power 40/45W (to duplexer)
Power Supply	
Primary Input Voltage	115/230 50-60Hz Standard U.S. Three Prong Plug

*Specifications are subject to change without notice



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AC3-02-005

Contact our Dealer for more information



MOTOROLA GP 328 HAND SETS



Compact and rugged, the GP328 Plus and GP338 Plus are ideal for professionals on the go.



Common Features

Advanced Audio Technology
Emergency Alarm/Siren
Switchable RF Power Levels
Repeater/Talkaround
Light/Normal Squelch
LED Battery Gauge
Voice Tagging

Enhanced Signalling

PTT-LED
Status/Messages
Call Alert
Voice Selective Call
Dual Priority Scan

Tight Thermal Squelch

Users have the flexibility to protect their communications by selecting a tight squelch to filter out the interference of unwanted local signals, or by switching to normal squelch to increase coverage.

GP328 Plus - Compact & Easy to Use

The compact GP328 Plus offers a robust solution for professionals on the go who want to stay in touch all day long. Equipped with user-friendly features and intuitive programmable functions for easy navigation, the GP328 Plus can enhance your productivity and streamline your radio operation.

16 Channels

Provides users with a maximum of 16 channels to organise different work groups to meet different communication needs.

LED Battery Gauge

The tri-colour LED battery gauge at the top of the radio alerts users to recharge the battery when the battery level is low.

Tone Tagging

Allows 8 different ringing tones to be assigned to 8 specific users/talkgroups - providing a radio caller identification to these groups.

GP328 Plus & GP338 Plus Common Key Features and Benefits

Advanced Audio Technology
A built-in special noise compressor and low level expander technology results in crisp, clearer and stronger audio quality, allowing you to keep communicating even in a noisy environment.

Emergency Alarm/Siren

Moving the need for urgent communication in critical situations, the easy-to-use, one-touch emergency button initiates a piercing alarm, providing users with instant help alerts.

Switchable RF Power Levels

By just pressing one button, users can switch to a low power when communicating within limited range coverage or switch to a high power level when further distance is required. A high transmit power optimizes range coverage while a low transmit power conserves battery consumption.

Repeater/Talkaround Enable/Disable

Users have the freedom to communicate through a repeater for wide area coverage, or bypass a repeater and talk directly to another radio if the coverage is within the range or when the repeater fails.

GP338 Plus - Compact & Versatile

The GP338 Plus offers a versatile two-way solution for those who require additional features to meet their expanding communication needs. No matter where it is used, in the rugged environment of the surveillance industry or the poise elegance of a hotel, the GP338 Plus is the radio of choice for any growing organisation.

14-Character Alpha Numeric Dot Matrix display

The 14-character alpha numeric display allows immediate communication of vital information such as PTT-LED, radio strength indicator and signal strength indicator. In addition, the user-friendly icons make the information easy to read and understand. The keypad and display illuminators also provide the needed visibility to operate your radio in the dark.

Received Signal Strength Indicator

An easy-to-read on-screen display indicator notifies users of signal strength in their vicinity.

Name & Tone Tagging

The capability of assigning 8 different ringing tones and visual caller IDs to 8 specific user/talkgroups enhances audio and visual caller identification for these groups.

Battery Strength Indicator

Easy-to-read on-screen LED display, battery alerts users on low battery strength.

128 Channels

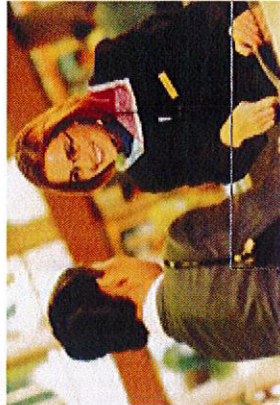
Provides up to a maximum of 128 channels, allowing greater flexibility in organising different work groups.



GP338 Plus

GP338 Plus

GP328 Plus & GP338 Plus Compact Light and Rugged



Compact

Manual Keys

The easy-to-navigate menu key allows users to select the relevant functionalities at their fingertips.

Dual Tone Frequency (DTMF) Encoder

Allows users easy access to local landline telephone networks or to make a private calls to other radio system users within the radio.

Enhanced Signalling Features for GP338 Plus

The GP338 Plus, beyond supports the following signalling system

ADCC1700 Signalling Protocol

PTT-LED

Every time the PTT button is pressed, it enables the transmission of the caller's ID and the decoding of the caller's ID.

Status/Messages

This feature enables you to replace frequently used voice calls with status messages, saving you valuable communication time.

Call Alert

If your call to a radio has no response, the radio will emit an alert tone until the other party takes action.

Voice Selective Call

The radio users receive a unique alphanumeric group voice message with an alert to indicate that it is a selective call.

Dual Priority Scanning

Allows activity on different channels to be monitored. Any incoming calls will be automatically switched to another available channel so that the call can be received.

Compact, Light & Rugged

Instant communication is important to many operators, as is the ability to be mobile and move freely without being weighed down by your communication tools.

Motors' most professional two-way radio packs a range of cutting edge innovations into a compact and lightweight unit designed to enhance the mobility of users of all shapes and sizes. The very best of portable radios is at your fingertips.

Intriguing Motorola GP328 Plus and GP338 Plus are compact enough to fit neatly underneath a jacket - most suited for any covert operation. They are light and can be worn comfortably on the waist, enabling hands-free mobility. And, for those in control during emergency rescue operations like air crashes, landings and more, the GP328 Plus and GP338 Plus are instant command and control tools with clear audio quality for you to manage a crisis efficiently.

Users

Public Safety

The GP328 Plus and GP338 Plus are compact enough to fit neatly underneath a jacket - most suited for any covert operation. They are light and can be worn comfortably on the waist, enabling hands-free mobility. And, for those in control during emergency rescue operations like air crashes, landings and more, the GP328 Plus and GP338 Plus are instant command and control tools with clear audio quality for you to manage a crisis efficiently.



Signature

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MONTGOMERY AND THE COMPLEX MAPPING OF ADJUNCTS AND EFFECTORS OF THE

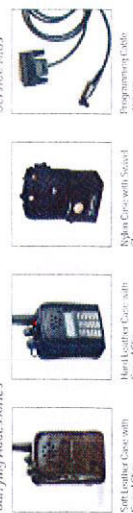
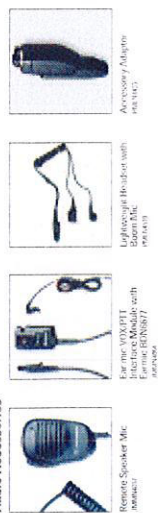
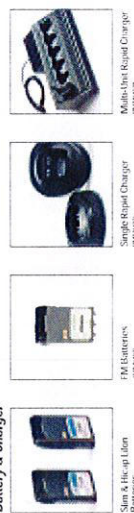
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Motorola's Smallest Profe



A comprehensive range of accessories is available so that the radios can be customised to suit your needs. Adding the proper headsets, microphones, batteries, chargers or carrying cases can enhance your operational productivity. Motorola's accessories are built with the highest quality standards and are specially engineered to ensure maximum performance of your radio, no matter what profession you're in.



^a χ^2 test comparing the two groups.

Variable	2010		2011		2012	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Age (in years)	50.1	1.2	50.2	1.2	50.3	1.2
Height (in cm)	170.5	5.8	170.6	5.9	170.7	6.0
Weight (in kg)	75.2	10.1	75.3	10.2	75.4	10.3
Body mass index (BMI)	26.1	3.5	26.2	3.6	26.3	3.7
Heart rate (b/min)	72.5	8.2	72.6	8.3	72.7	8.4
Systolic blood pressure (mmHg)	120.1	12.5	120.2	12.6	120.3	12.7
Diastolic blood pressure (mmHg)	80.5	9.8	80.6	9.9	80.7	10.0
Resting heart rate (b/min)	68.2	7.1	68.3	7.2	68.4	7.3
Maximal heart rate (b/min)	185.4	10.5	185.5	10.6	185.6	10.7
Maximal systolic blood pressure (mmHg)	160.2	15.1	160.3	15.2	160.4	15.3
Maximal diastolic blood pressure (mmHg)	105.1	11.2	105.2	11.3	105.3	11.4



PMN455
to be used with 3.5mm
threaded range of Audio

DIGITAL CLOCK



REQUIREMENTS FOR DIGITAL CLOCK

Adequate digital clock available locally.

Signature



REQUIREMENTS FOR BINOCULAR

Binocular should be day and night visible and adequate to see both end of runway clearly from the control tower.



