RadioStar FST-5270

Document Control

Document ID	T/15226
Document Name	FST-5270 Inputs and Outputs
Security	Fair Dealing
Circulation	Design 2000, Motorola Solutions Australia, Telstra, Queensland Government
Prepared By	Peter Zeug
Reviewed By	Ross Kells
Approved By	

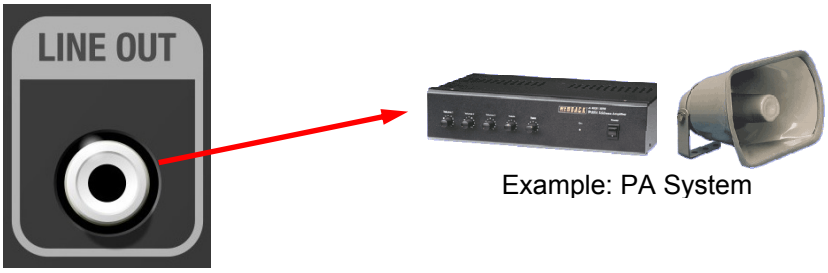
Version Control

Edition	Date	Notes
Issue 1	04/02/2015	First release
Issue 2	05/02/2015	Power and RF sockets added
Issue 3	20/02/2015	Back Panel layout changes
Issue 4	23/02/2015	Height lowered to 3RU
Issue 5	06/03/2015	Correct Battery and Speaker polarity
Issue 6	06/03/2015	V.24 port removed
Issue 7	09/03/2015	E&M Tx & Rx clarified, XCMP clarified
Issue 8	11/03/2015	Dimensions added
Issue 9	13/03/2015	Photo of rack mount brackets
Issue 10	16/04/2015	COS sense
Issue 11	31/07/2015	Audio Level Adjustments
Issue 12	17/08/2015	Battery Runtime
Issue 13	07/10/2015	Mains input specs
Issue 14	28/10/2015	RF Attenuator
Issue 15	09/04/2018	E&M Clarified

Contents

Inputs and Outputs (I/O)

LINE OUT



Example: PA System

RCA Jack (600Ω balanced)

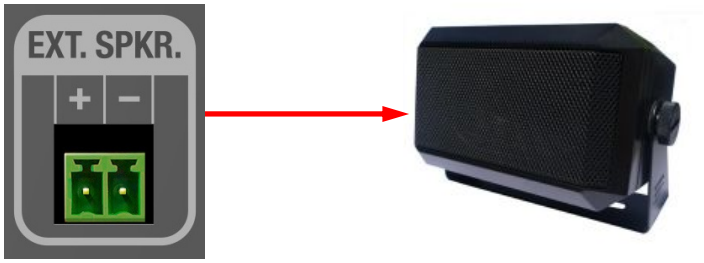
For connection to PA system line input, telephone FXS port, powered PC speakers or voice logger. Either Rx audio or Tx and Rx audio (CPS programmable).

Pin Number	Description	Level / Sensitivity
Centre	Hot	-10dBm nominal
Sleeve	Cold	-10dBm nominal

EXTERNAL SPEAKER

Dinkle® Mini Pluggable Screw/Clamp Terminal

For connecting an optional unpowered external speaker (eg. 7.5W nom., 8 Ohm).



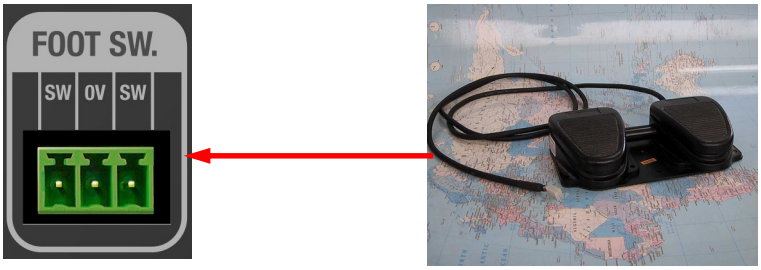
DESK MIC

RJ45 Jack

For Motorola RMN5068A or HMN3000B-4273 Desktop Microphone.

Pin Number	Description	Level / Sensitivity
1 & 2	Not Connected	
3	PTT	Pull down to activate
4	Microphone	Bias voltage 12V
5	Ground	0V
6	Hook	Via LK4 to MON (Not implemented)
7 & 8	Not connected	

FOOTSWITCH

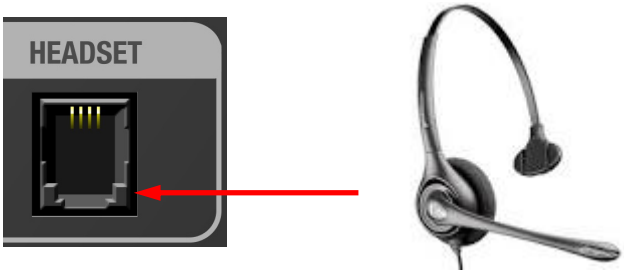


Dinkle® Mini Pluggable Screw/Clamp Terminal

For footswitch such as the Motorola 40C82663C06 foot pedal or newer models.

Pin Number	Description	Level / Sensitivity
1	PTT	Pulling this line to ground will enable the PTT function, activating the AUX_MIC input.
2	GND	0V
3	PTT	Pulling this line to ground will enable the PTT function, activating the AUX_MIC input.

HEADSET



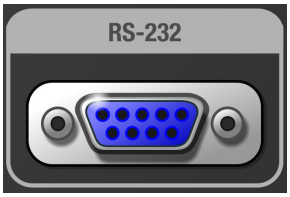
RJ9 (RJ22) Jack

For Plantronics HW251N or H141N Headset. Other makes of headsets may also be used but these have not been tested at the factory.

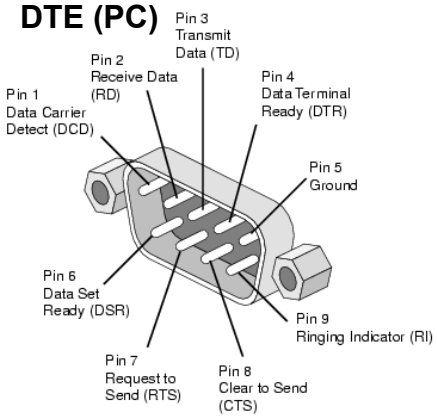
Pin Number	Description	Level / Sensitivity
1	Speaker +	Speaker drive (adjustable Rx level)
2	Microphone -	Microphone return
3	Microphone +	5.6V bias (adjustable Tx level)
4	Speaker -	Speaker return

RS-232

DCE (APX)



DTE (PC)

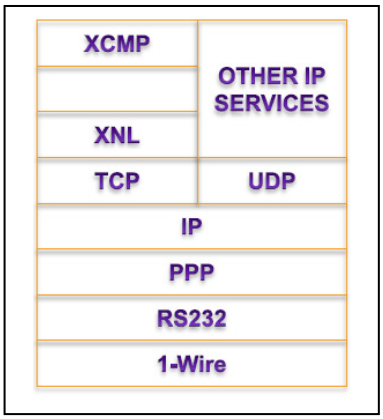


DB9 (DE-9P) Female

Broken out from radio's J2 accessory connector and provides a pass-through.

Pin Number	Description	Level / Sensitivity
1	Data Carrier Detect	Not connected
2	Transmit Data	DCE_TXD (DTE RXD)
3	Receive Data	DCE_RXD (DTE TXD)
4	Data Terminal Ready	Not connected
5	Signal Ground	Ground
6	Data Set Ready	Not connected
7	Request to Send	DCE_RTS
8	Clear to Send	DCE_CTS
9	Ring Indicator	Not connected

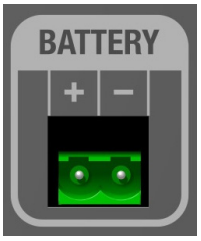
Using the APX RS-232 protocol stack, full XCMP/XNL Device Control is possible. Any third party connected equipment requires a Motorola Licensing Agreement and Authentication key.[1]



[1] Licence available from Motorola Solutions Inc.

Other IP Data services are also available via the User Datagram Protocol (UDP) and these do not require a license.

EXTERNAL BATTERY OR EXTERNAL 12V SUPPLY



Dinkle® Pluggable Screw/Clamp Terminal

For 12V 7.2Ah sealed lead acid battery or external 12V supply in rack mount applications.

12V Rack Mount Applications

19” 3RU mounting brackets are sold separately. These have M4 nutserts on the front for the Mic Cradle. In 12V rack mount applications, the 230V a.c. mains lead is simply not connected and the FST-5270 operates from the external 12V supply instead. In this operating mode inbuilt Schottky steering protection diodes prevent any additional power drain.

Battery Backup Applications

If a battery is connected, it is automatically charged whenever the mains power is connected.

Battery Runtime

The supplied battery is 7.2Ah SLA type.

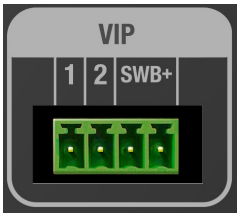
The APX 6500 radio running on 13.8V has a standby current of 0.85A, a Receive current of 3.2A and a Transmit current of about 6A @ 10W.

With a 25% duty cycle on a continuous basis (25% transmit and 75% standby), a charged battery will last for 3.368 hours (3 hours, 22 min, 6 secs).

With a 10% duty cycle on a continuous basis (10% transmit and 90% standby), a charged battery will last for 5.275 hours (5 hours, 16 min, 29 secs).

Pin Number	Description	Level / Sensitivity
1	Battery or d.c. supply +ve	+12V
2	Battery or d.c. supply -ve	0V

Vehicle Interface Port (VIP)

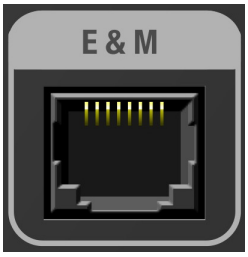


Dinkle® Mini Pluggable Screw/Clamp Terminal

Vehicle Interface Port (VIP) broken out from J2 connector. These outputs are used to turn on 12V devices such as horns, sirens, strobes and lights.

Pin Number	Description	Level / Sensitivity
1	VIP 1	+12V, 0V when active
2	VIP 2	+12V, 0V when active
3	SWB+	+12V when radio is on
4	SWB+	+12V when radio is on

E&M



RJ45 Jack

E&M (Earth & magneto, ear & mouth, or recEive and transMit) signaling provides the means to remotely signal and control the radio as well as provide external two-way audio. The E&M Interface has PTT in, Channel Activity out and 600Ω balanced Tx and Rx audio - suitable for connection to, say, a Motorola MCC7500 VPM Console, an audio bridge, a telephone interconnect unit, a Conventional Channel Gateway (CCGW) or Audio Management Unit. (AMU).

Pin-outs are shown with respect to the RadioStar FST-5270.

Pin Number	Description	Level / Sensitivity
1	PTT IN to FST radio J2 Aux PTT input	Relay normally open
2	PTT IN to FST radio J2 Aux PTT input	Relay common
3	Audio IN to FST radio J2 Accessory connector. Audio received from the remote equipment and transmitted to operators listening to the RadioStar FST	Rx audio + (-10dBm nom.)
4	Audio OUT return	Tx Audio -
5	Audio OUT from FST radio J2 Accessory connector. Audio transmitted to the remote equipment and received by the operators listening to the remote equipment	Tx audio + (-10dBm nom.)
6	Audio IN return	Rx audio -
7	Channel Activity OUT from FST radio J2	Relay normally open or normally closed (Strappable for active high or active low)
8	Channel Activity OUT from FST radio J2	Relay common

The E&M interface can also be connected to external unbalanced audio circuits by connecting the return paths to the common ground of the external equipment.

AUDIO LEVEL ADJUSTMENTS

The line audio levels are factory set to -10dBm (245mV $_{RMS}$) nominal but are adjustable from -20dBm (80mV $_{RMS}$) to -5dBm (440mV $_{RMS}$) for 60% system deviation.

There is quite a variance of opinion about standard mic levels. The reference mic level used by Design 2000 is -34dBm (15mV $_{RMS}$). The RadioStar mic inputs have a nominal input level of -34dBm (15mV $_{RMS}$) but much higher levels around -20dBm (80mV $_{RMS}$) to -8dBm (300mV $_{RMS}$) for 60% deviation are supported for different types of microphones.

Assumptions

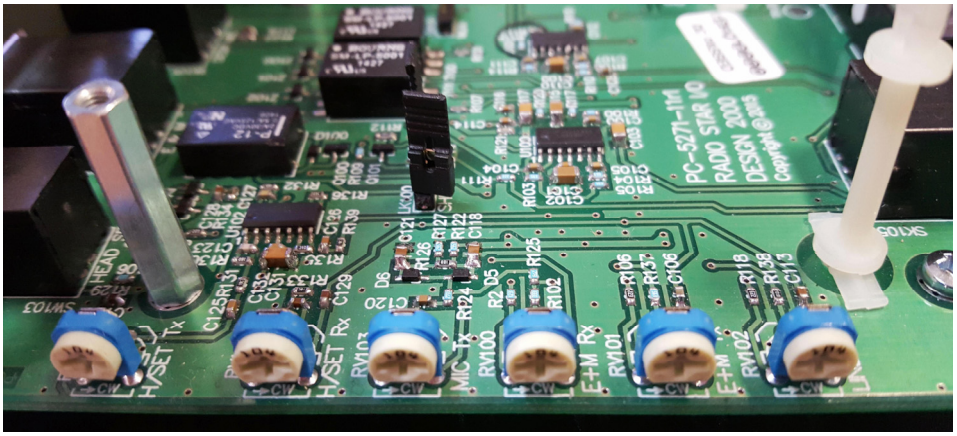
This document assumes that qualified installers and maintenance technicians perform the installation and maintenance procedures and are therefore aware of basic wiring and installation 'Industry Best Practices'. The Occupational Health & Safety of all personnel working on or near this equipment is the responsibility of the installer or technician performing the tests or operations.

Warning

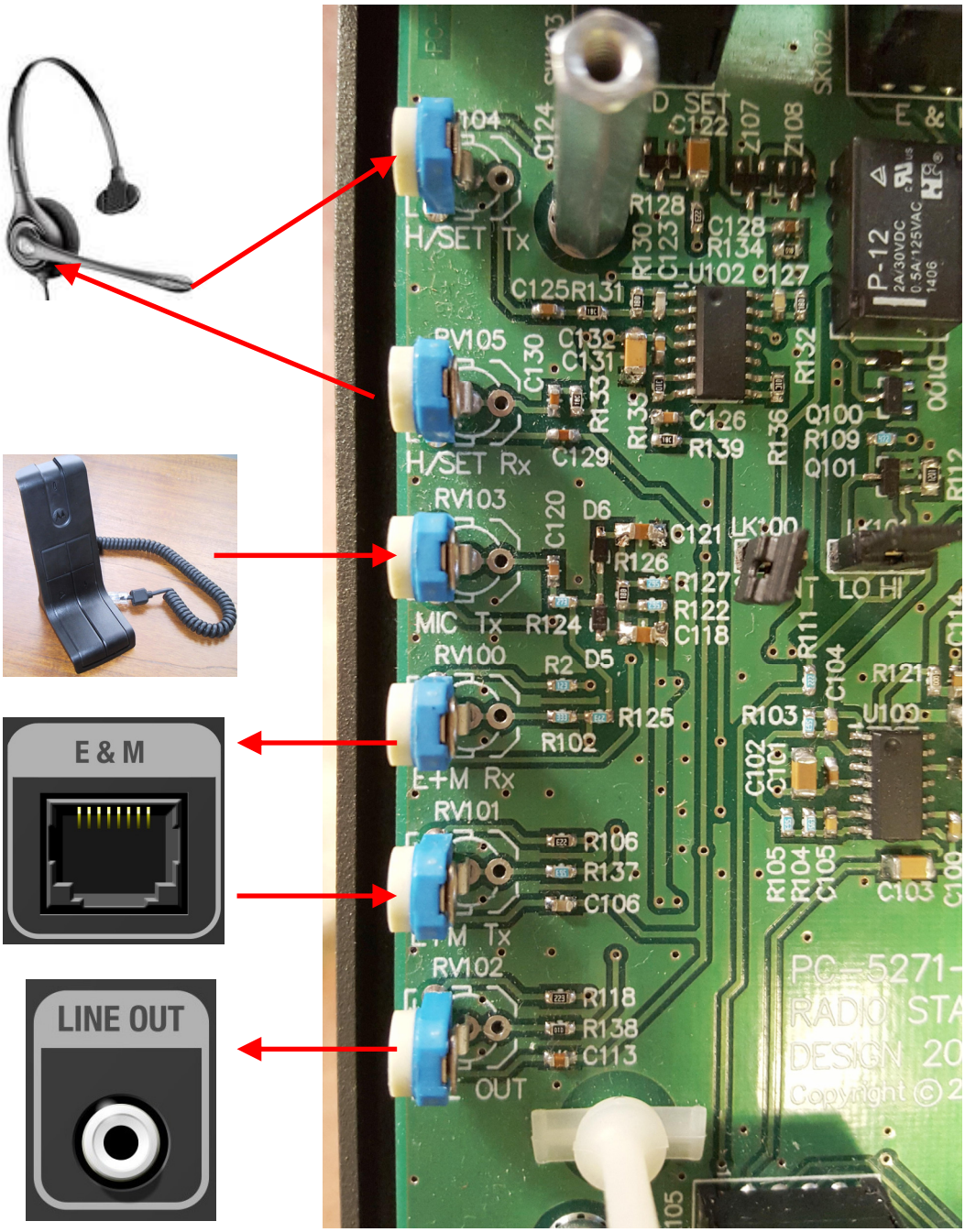
This equipment may contain lethal voltages, and must be isolated from supply before any cover is removed.

To access the volume potentiometers, disconnect the mains supply and remove the cover:

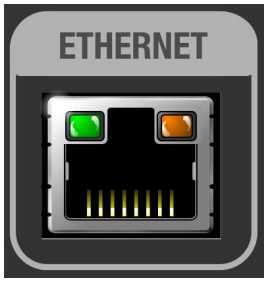
Audio volume potentiometers



Turning the potentiometers clockwise increases the audio levels.



ETHERNET



RJ45 MagJack

The RadioStar FST-5270 Ethernet jack is an IP Interface that provides an internal Web page (or Home page) for the configuration of the FST.

Also on the web page, on a per application basis, custom buttons can be made available to send, say, a Status message across the P25 radio network to another radio. The construction of custom buttons is not made available to any third party and is subject to an APX ADK License Agreement on a per project basis.

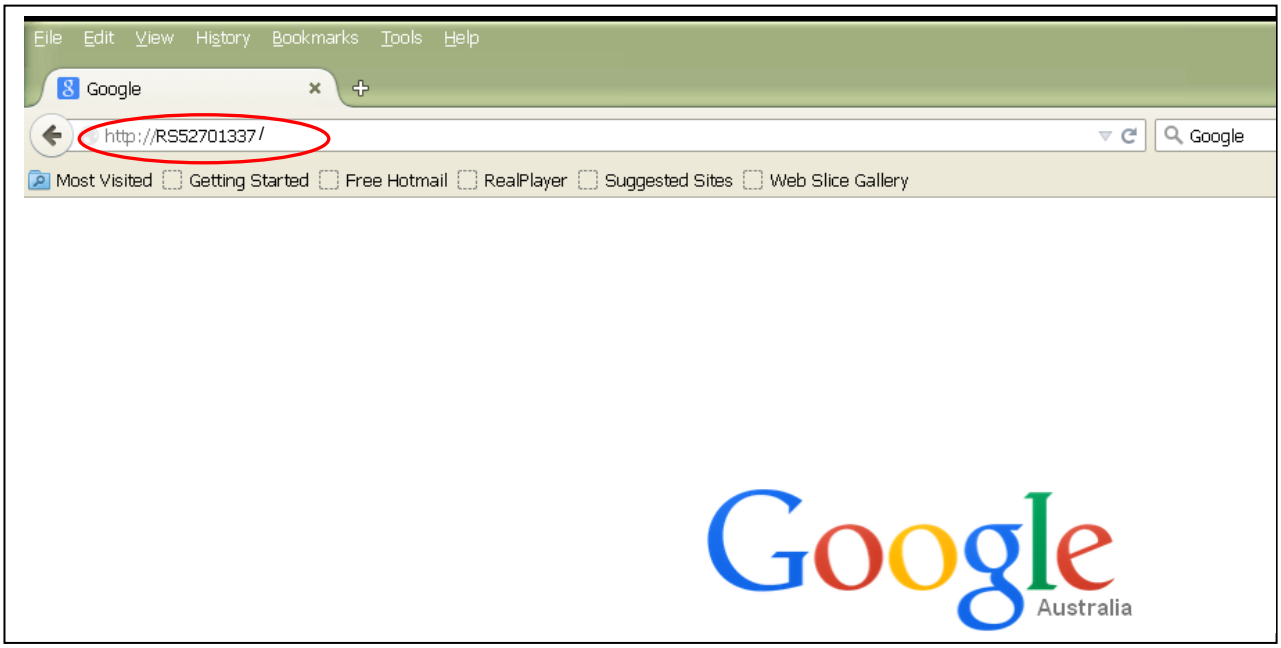
As another example, the RadioStar's IP Interface could regularly check an email account (SMTP) for mail containing a phrase or password in the title, then take action based on the body text of that email (eg. "ALERT RADIO 1234").

Pin Number	Description	Level / Sensitivity
1	Transmit Data	TXD+
2	Transmit Data	TXD-
3	Receive Data	RXD+
4		
5		
6	Receive Data	RXD-
7		
8		

Network Connection

Connect the RadioStar's Ethernet jack to a spare LAN port on the Router or Switch using a standard CAT5, CAT5e or CAT6 network patch cable. Wait a minute or so for the Router to lease an IP address to the RadioStar which defaults to DHCP.

Open your Browser and type the RadioStar's serial number (it's on the back of RadioStar) into the address bar, eg. http://RS52701337/ (include the RS and /):



Press ENTER and this should bring up RadioStar's Home page:

Note that your Browser may do a Google search and not find RadioStar. Contact your Network administrator for instructions on how to do a local search.

FIST MIC CRADLE

The fist mic cradle can be mounted on either side of the FST-5270. M4 "Nutserts" for the Microphone cradle screws are standard on both sides of the enclosure.

19” RACK MOUNTING

19” 3RU mounting brackets are sold separately. These also have M4 nutserts on the front for the Mic Cradle.

Part Number RA-5272 Item 2.14

In 12V rack mount applications, the 230V a.c. mains lead is simply not connected and the FST-5270 operates from the external 12V supply instead. In this operating mode inbuilt Schottky steering protection diodes prevent any additional power drain.

POWER

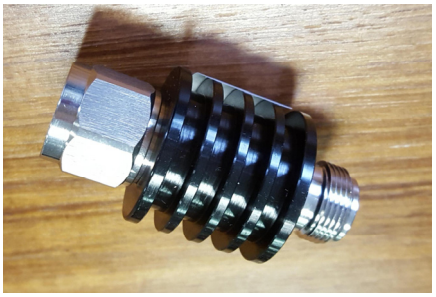
IEC C14 MAINS SOCKET

Pin Number	Description	Level / Sensitivity
Left	Neutral	Return
Centre	Earth	Must be Earthed
Right	Active	230V a.c. nom.

The RadioStar FST-5270 is normally powered from the mains supply. It can be internally switched for either 115V~ operation or 230V~ operation. A standard Australian 3 pin plug to IEC C13 1.8m mains lead is supplied as standard. The centre pin must be Earthed.

When set for 230V~ operation the voltage input range is 176 - 264V a.c. and the frequency input range is 47 - 63Hz

ANTENNA



TYPE N FEMALE JACK

SP0000-7410-02 10dB RF ATTENUATOR

Pin Number	Description	Impedance / Frequency
Center	Conductor	50Ω, d.c. – 11GHz
Outer	Shield	

The Antenna for the radio is connected to the 50 Ohm Type N female jack. Other connectors such as BNC and Mini-UHF may be optionally fitted instead. In fixed installations where an **indoor antenna** is used, the 10dB in-line attenuator must be fitted to reduce the radio's RF output power from 10W down to 1W.

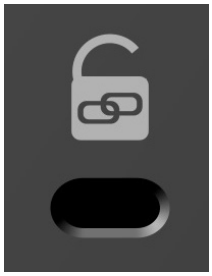
GPS

SMA FEMALE JACK

Pin Number	Description	Impedance / Frequency
Center	Conductor	50Ω, d.c. – 18GHz
Outer	Shield	

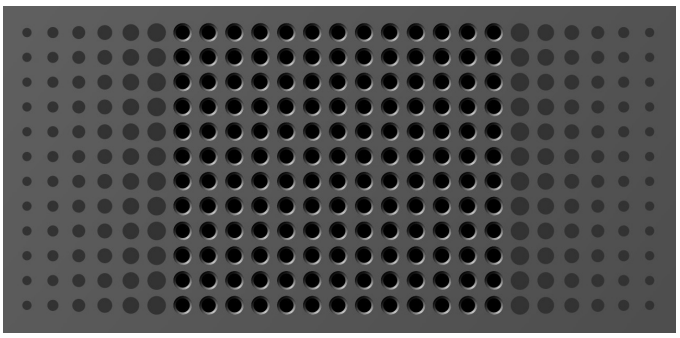
A GPS antenna is connected to the SubMiniature Version A (SMA) connector.

ANTI-THEFT SECURITY SLOT



This is a standard 3mm x 7mm slot for universal combination security lock chains commonly used for Laptop, PC and TV theft prevention.

INBUILT SPEAKER



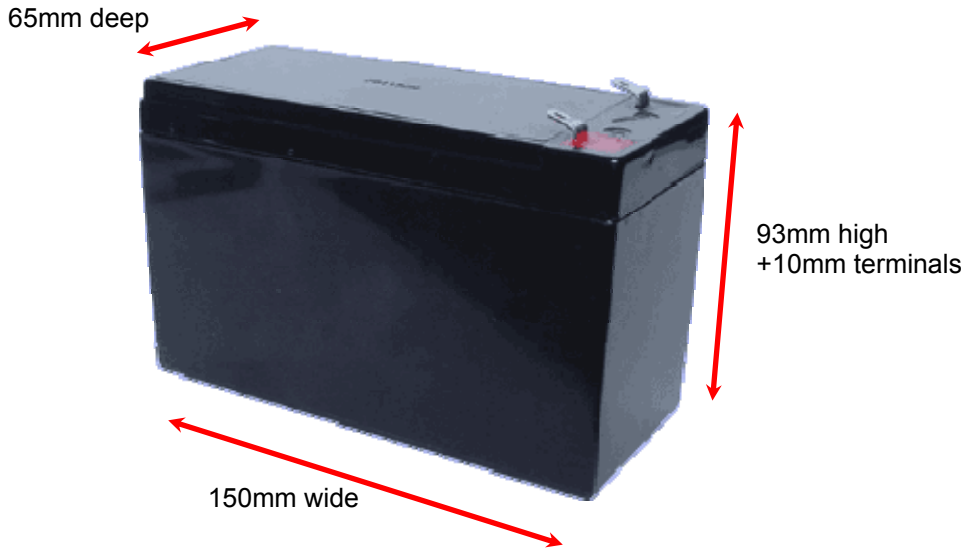
This is a 63mm Mylar cone $5W_{RMS}$ 8 Ohm Speaker with a sensitivity of 89 ± 2 dB/W/M, 2.83V.

DIMENSIONS

Radio Star 5270

Weight including radio: 9.0kg

External Battery – 7.2Ah SLA Type



Weight: 2.12kg

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