



HF-90 COMPACT TRANSCEIVER



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

The HF-90 has been designed with the user in mind. Not only is it simple to operate, but it is also priced competitively to suit both commercial and military requirements. Furthermore, it is value-engineered to ensure low cost of ownership over the long term.

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 Watt, whilst achieving low battery consumption. It is also extremely reliable due to the advanced SMD manufacturing process used and overall design efficiency.

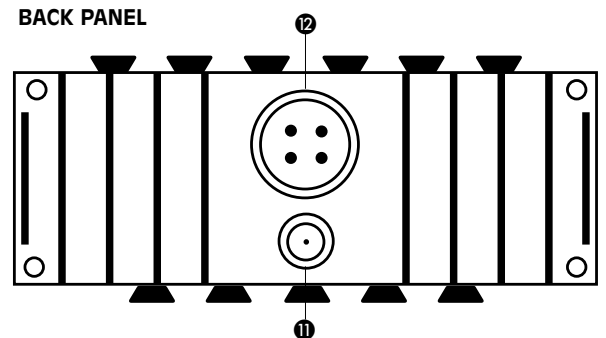
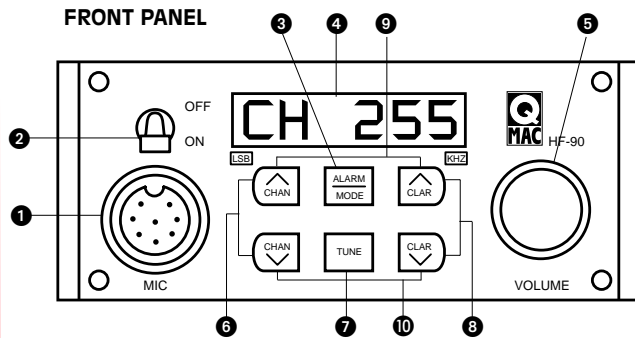
The specifications of the HF-90 will enable reliable communications up to distances of 3,000km*. In addition, the transceiver incorporates superior signal handling capability which ensures excellent reception even in the most crowded radio environments.

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

* Subject to antenna configuration, frequency in use and environmental conditions.



CONTROLS & SOFTWARE FEATURES



- 1 Eight pin microphone connector (screw-in type). Incorporates RS-232 link.
- 2 On/Off switch.
- 3 Alarm key ^(A).
USB/LSB mode selection key ^(I).
Fixed/hopping mode selection key ^(FH).
- 4 Six digit LED display (7-segment).
- 5 Volume control knob.
- 6 Channel up/down scroll keys. Pressing both keys together enables access to PC Programming.
- 7 Tune key. Allows continuous signal to be transmitted for tuning long wire antennas.
- 8 Clarifier up/down scroll keys. Pressing both keys together enables access to field programming ^(I) & ^(FH).
- 9 Pressing both keys together enables channel erase facility.
- 10 Pressing both keys together enables Rx signal strength meter.
- 11 BNC antenna connector (bayonet type).
- 12 Four pole DC connector. Incorporates ATU control and loudspeaker signal.

Q-MAC Electronics has designed the HF-90 Transceiver so that it is simple to operate, incorporating only essential controls. However, an advanced option incorporating additional features is also available. The differences between the standard and advanced model are outlined below:

STANDARD MODEL

The standard HF-90 incorporates the facilities indicated in the above illustrations (with the exception of field programming and frequency hopping facilities). PC programming of the standard model is possible, using a simple Windows based PC software package, together with a programming cable which plugs into the HF-90 microphone connector (providing an RS-232 link). Note that the standard model is fully data capable. A compact speaker microphone is provided with this model, along with the appropriate DC power cable.

ADVANCED MODEL

The advanced HF-90 includes all features in the standard model, plus Selcall (Selective Calling) facilities, field programming ^(I) & ^(FH) and frequency hopping (optional) ^(FH).

Selcall is a very effective digital calling system which allows each set to be designated with its own 4-digit ID. The Selcall format used in the HF-90 is the Australian Standard (based on CCIR International Standard 493-4), which is fully compatible with other Australian brands. Other Selcall based facilities offered include Telcall (allowing the HF-90 to subscribe to telephone interconnect systems) and Beacon Call (which provides a very timely and accurate measure of frequency suitability).

Selcall ID may be programmed in the field for all versions (including the Australian Version). Additional parameters which can be field programmed ^(I) & ^(FH) include power output, auto-tune setting, channel/frequency selection, Selcall setting, scan setting and mode setting. Frequency hopping parameters which can be field programmed ^(FH) include hop configuration, Smart Hopping setting and hop code.

Note that Selcall and field programming facilities require DTMF keypad entry. Therefore a DTMF microphone/handset is supplied with the advanced model, along with the appropriate DC power cable.

(A) Australian Version only
(I) International Version only
(FH) Frequency Hopping Version only

CONSTRUCTION & SERVICE FEATURES

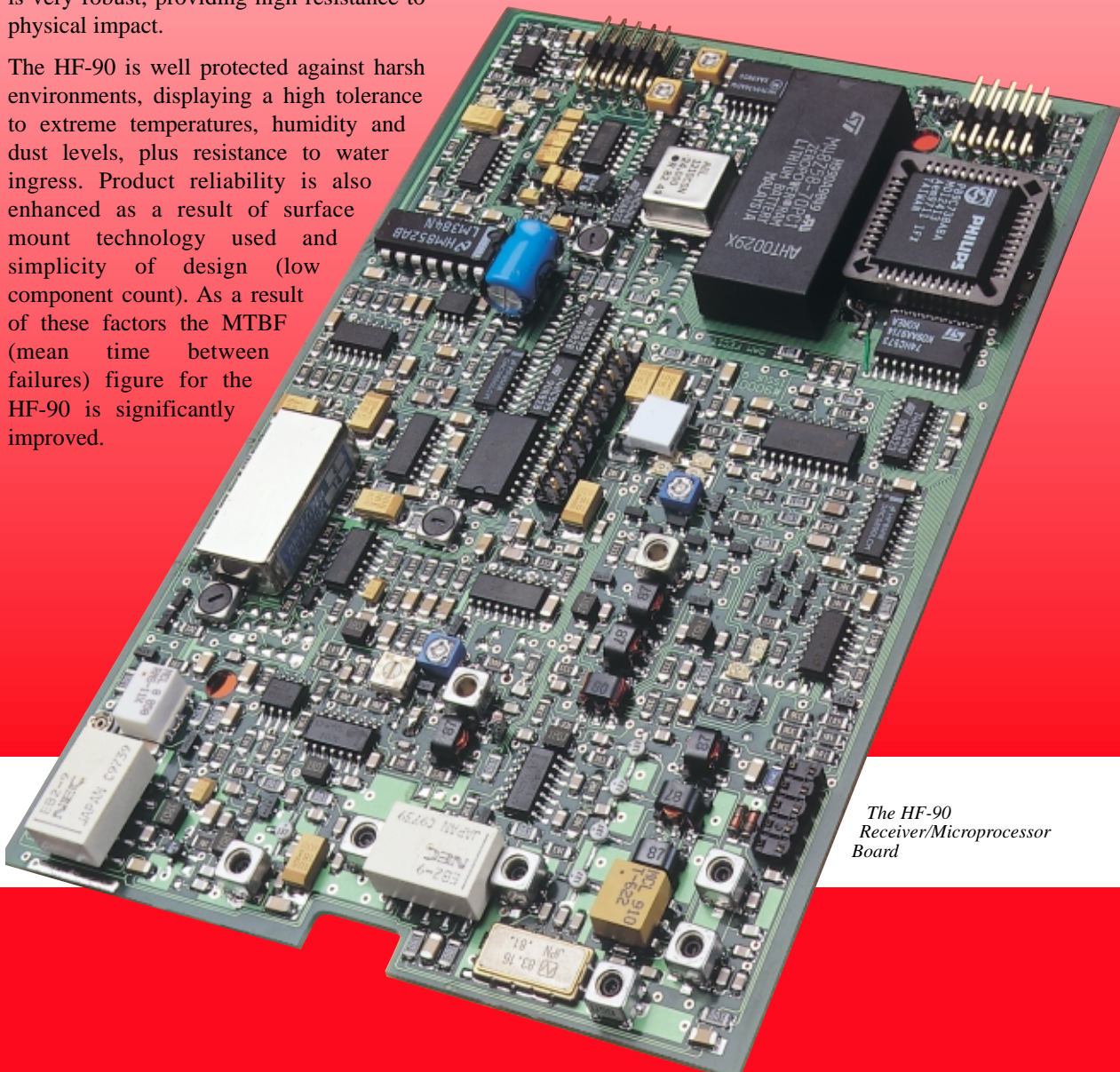
Q-MAC Electronics has designed the HF-90 so that it will adapt to multiple configurations. Its compact size, light weight and low battery consumption make it ideal for portable and man-pack applications. Its maximum power output of 50 Watt and full frequency coverage also make it suited to vehicle and base station configurations. In addition, the HF-90 has a DC supply voltage from 10-28 Volt, accommodating a variety of batteries and AC power supplies. The high voltage capability is a significant advantage for military and heavy vehicle installations. A full range of accessories is offered by Q-MAC Electronics to support the multiple configurations of the HF-90.

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 heatsink and stainless steel handles on the front panel. The LED display is very robust, providing high resistance to physical impact.

The HF-90 is well protected against harsh environments, displaying a high tolerance to extreme temperatures, humidity and dust levels, plus resistance to water ingress. Product reliability is also enhanced as a result of surface mount technology used and simplicity of design (low component count). As a result of these factors the MTBF (mean time between failures) figure for the HF-90 is significantly improved.

The unit incorporates a BITE (built-in test equipment) function, which allows identification of possible faults, to a board or sub-unit level. Accurate fault location is further enabled by the provision of test points on IDC pin headers. If a fault is identified the unit is extremely simple to service. All internal PCBs can be accessed and probed without the need for special tools or jigs. In addition, the PCBs connect together directly so that there is no requirement for any looms or de-soldering of joints when exchanging boards. Furthermore, the low component count in the HF-90 means that the requirement to carry spares inventory is reduced.

The HF-90 is designed so that it is simple and economical to service. In addition, a comprehensive 3 year warranty and module exchange program offer further support for dealers and end users.



*The HF-90
Receiver/Microprocessor
Board*

HF-90 TECHNICAL SPECIFICATIONS



GENERAL

Frequency range:	2 ⇄ 30MHz
Modes of operation:	USB, LSB (J3E), CW (optional), Hopping (optional), AM (Rx only), FSK
Number of channels:	255
Channel resolution:	100Hz
Supply voltage:	12 ⇄ 24V DC nominal
Power consumption:	
- Transmit:	2A ⇄ 10A (subject to pre-set power output)
- Receive:	310mA
Frequency stability:	± 2ppm
Antenna impedance:	50Ω
Antenna connector:	BNC
Handsets:	Speaker microphone DTMF microphone & telephone handset
Selcall system:	Based on CCIR 493-4 (Australian Standard)
Programming:	Via front panel & DTMF mic/handset or IBM PC 4800,8,1,N
BITE:	Micro, Rx, Tx tests

ENVIRONMENTAL

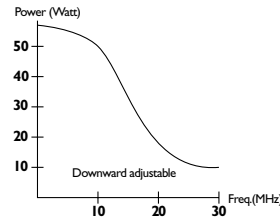
Operating temperature:	-30°C ⇄ 60°C
Storage temperature:	-30°C ⇄ 80°C
Humidity:	95% non-condensing
Environmental rating:	IP54

PHYSICAL CHARACTERISTICS

Dimensions (mm):	112(W) x 47(H) x 220(D)
Weight:	1kg (HF-90 only)
Construction:	All metal extruded sleeve with front panel and heatsink
Finish:	Black anodised aluminium

TRANSMITTER

Power output: 50 Watt PEP



Duty cycle:	Normal speech or data (with fan option)
Unwanted sideband:	Better than -45dB
Carrier suppression:	Better than -50dB
Harmonic suppression:	Better than -40dB
Spurious emissions:	Better than -40dB
Noise suppression:	Better than -35dB
Distortion:	Less than 5% @ 70% PEP
Audio response:	270Hz ⇄ 2800Hz
Microphone:	Electret insert
Tune:	20W radiated @ +1000Hz
Load protection:	ALC

RECEIVER

Sensitivity:	0.25μV for 10dB S+N/N
Selectivity:	2.3kHz @ -6dB 6kHz @ -60dB
Image rejection:	Better than -50dB
Intermodulation:	Better than -70dB
3rd order intercept:	+18dBm (GaAsFET mixer)
Blocking:	Better than -70dB
Spurious response:	Better than -60dB
IF rejection:	Better than -60dB
Intermediate freq's:	83.16MHz, 455kHz
AGC:	Less than 3dB from 3μV ⇄ 1V
Clarifier range:	± 250Hz
Audio response:	270Hz ⇄ 2800Hz
Audio output:	2Watt
Audio load impedance:	8Ω
Audio distortion:	Less than 5% @ 1W

Specifications are subject to change without notice.

Represented by:

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