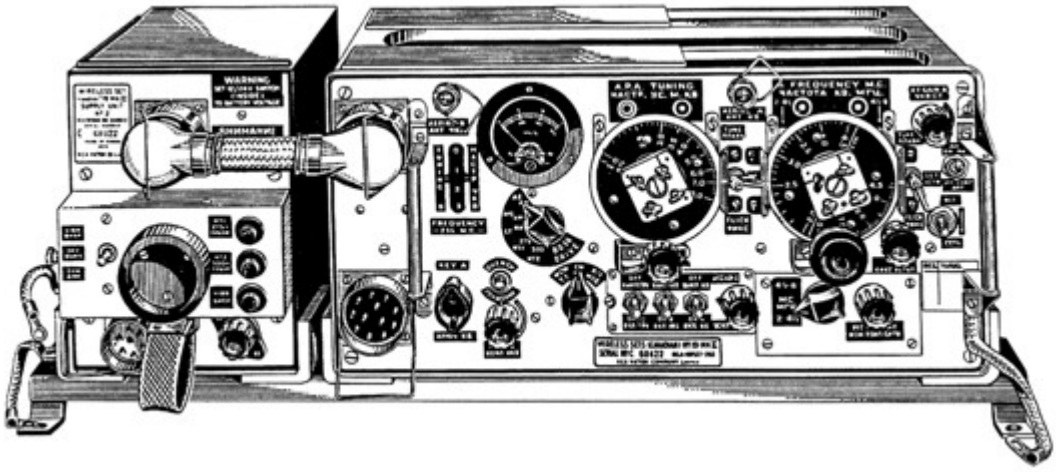


Wireless Set No 19 Mk.3 (Canadian)

RA180 CREWGARD HEADSET

RACAL

RA180 CREWGARD HEADSET

- **Adopted by the British Army**
- **Excellent Noise Attenuation**
- **Rugged & Reliable**
- **High Degree of Comfort**
- **Compatible with NBC Clothing**

The Crewgard Headset is normally integrated with a Kevlar Helmet to provide AFV crewmen with a protective communications helmet. This product is the culmination of an eight year programme with the Ministry of Defence.

The protective communications helmet is designed to meet the needs of AFV crewmen in the high noise environment to be found in main battle tanks and other armoured fighting vehicles.

The communications headset can be worn separately or with the helmet shell, depending on the role requirements

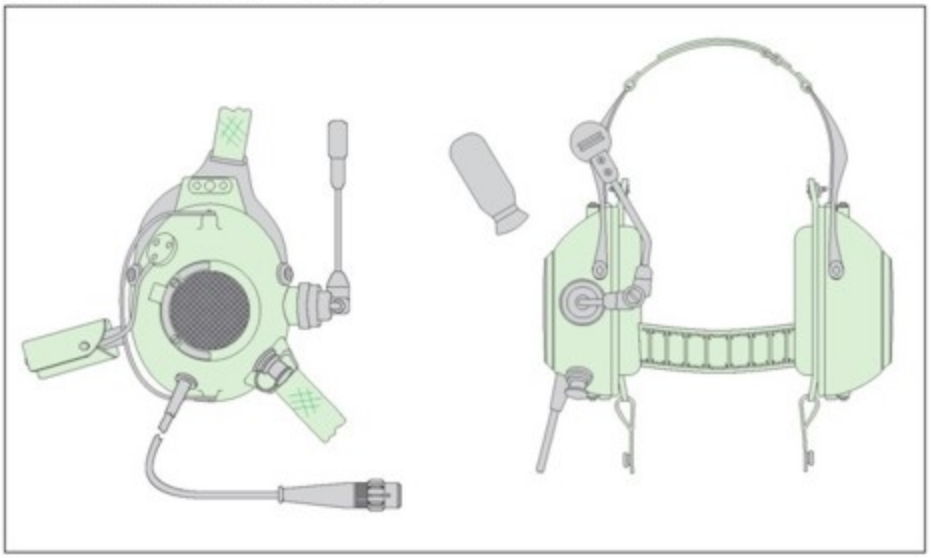
PRODUCT DESCRIPTION

Headset Description

As well as being used as an integrated communications helmet, the headset can be worn on its own, giving excellent communications with full hearing protection, and the helmet can be worn separately for normal sentry duties. The high performance noise excluding earshells are fitted with an acoustic valve developed and patented by Racal Acoustics Limited. The mechanically operated valve gives very good passive protection against high noise levels when closed, but when open allows the wearer to hear speech and other ambient sounds. When the valve is in the open position, a specially designed fast response attenuator protects the wearer from impulse noise such as explosive detonations. The design of the ear cushions provides an acoustic seal to the head, in order to provide good passive noise attenuation, and gives a high degree of comfort, allowing the headset/helmet to be worn for long periods. The headset/helmet is fully compatible with S6 and S10 respirators and can be used with full NBC clothing.

The headset is fitted with a boom-mounted high quality noise cancelling microphone, which provides discrimination between close speech and high levels of ambient noise in the AFV environment. The boom assembly allows the microphone position to be optimised between the centre and corner of the lips for all users. Wind noise protection is provided for by an expanded plastic foam microphone cover. A socket is provided on the earshell for a respirator microphone to be connected.

The earshells are mounted in a flexible strapping or webbing harness fitting over the head so as to locate the earshells correctly over the ears. The pressure required to ensure adequate hearing protection is provided by an adjustable metal neckband. The helmet shell is secured to the headgear by vertical straps which attach to the upper part of the earshells. Stability on the head is ensured by a webbing chinstrap. The headgear can be rapidly removed from the helmet, or reconnected to it, by snap-fit connectors. Sufficient adjustment is provided to allow the assembly to fit all sizes of head between the 5th and 95th percentile without degradation of acoustic performance.



TECHNICAL SPECIFICATIONS

ELECTRO-ACOUSTIC DATA

Earphone and microphone measurements are made as described in publication 8133.

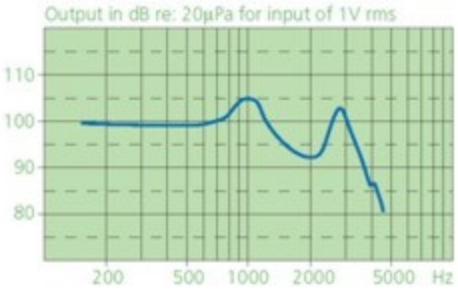
Earphones

Transducer part no: 19575/1

Transducer type: high power moving iron earphone

Sensitivity: 103dB SPL re 20µPa/V at 1kHz nominally

Typical frequency response:

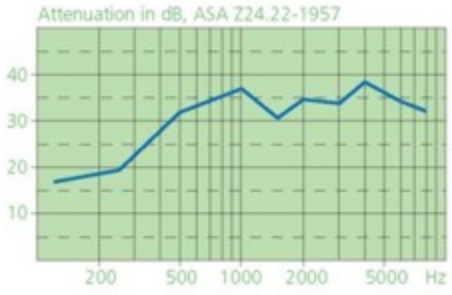


Impedance: Each receiver 300ohms at 1kHz nominally

Climatic: Environmentally Protected

Earshell Attenuation

The subjective attenuation characteristic of the Crewgard Headset, when properly fitted, is as shown below:-



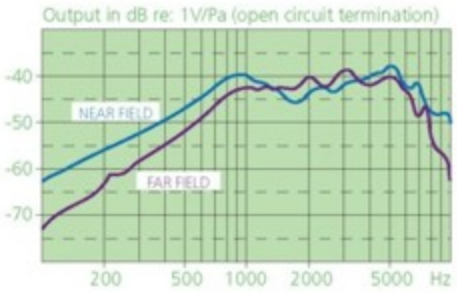
Microphones

Transducer part no: 25690

Transducer type: noise cancelling moving coil microphone

Sensitivity: -61dB re 1V/Pa, open circuit at 1kHz nominally

Typical frequency response:



Impedance: 200ohms at 1kHz nominally

Noise cancelling performance: difference in output level of nominally 14dB at 200Hz between near field and far field (i.e. at 1m from source)

Climatic: Environmentally Protected

Transducer part no: RA430

Transducer type: rocking armature respirator microphone

Sensitivity: -51dB re 1V/Pa, open circuit at 1kHz nominally

Typical frequency response:

Impedance: 450ohms at 1kHz nominally

Connector: 3-pin pattern 105

ELECTRICAL DATA

Communications

Headsets can be offered which are compatible with a wide range of radio equipment and vehicle harness systems. Standard configuration is 300ohms, 3-wire, split earphone working.

Switches

A variety of in-line Press-to-talk (PTT) switches are available (refer technical leaflet TS 7264). Customer to detail wiring of switches.

Cables

A variety of both straight and coiled cables to Military Standards can be supplied to suit customer requirements (refer technical leaflet TS 7265)

PHYSICAL DATA

Environmental

Usage temperature: -30°C to +55°C

Storage temperature: -40°C to +70°C

Humidity range: Up to 95% RH

Mass

Mass: 750g

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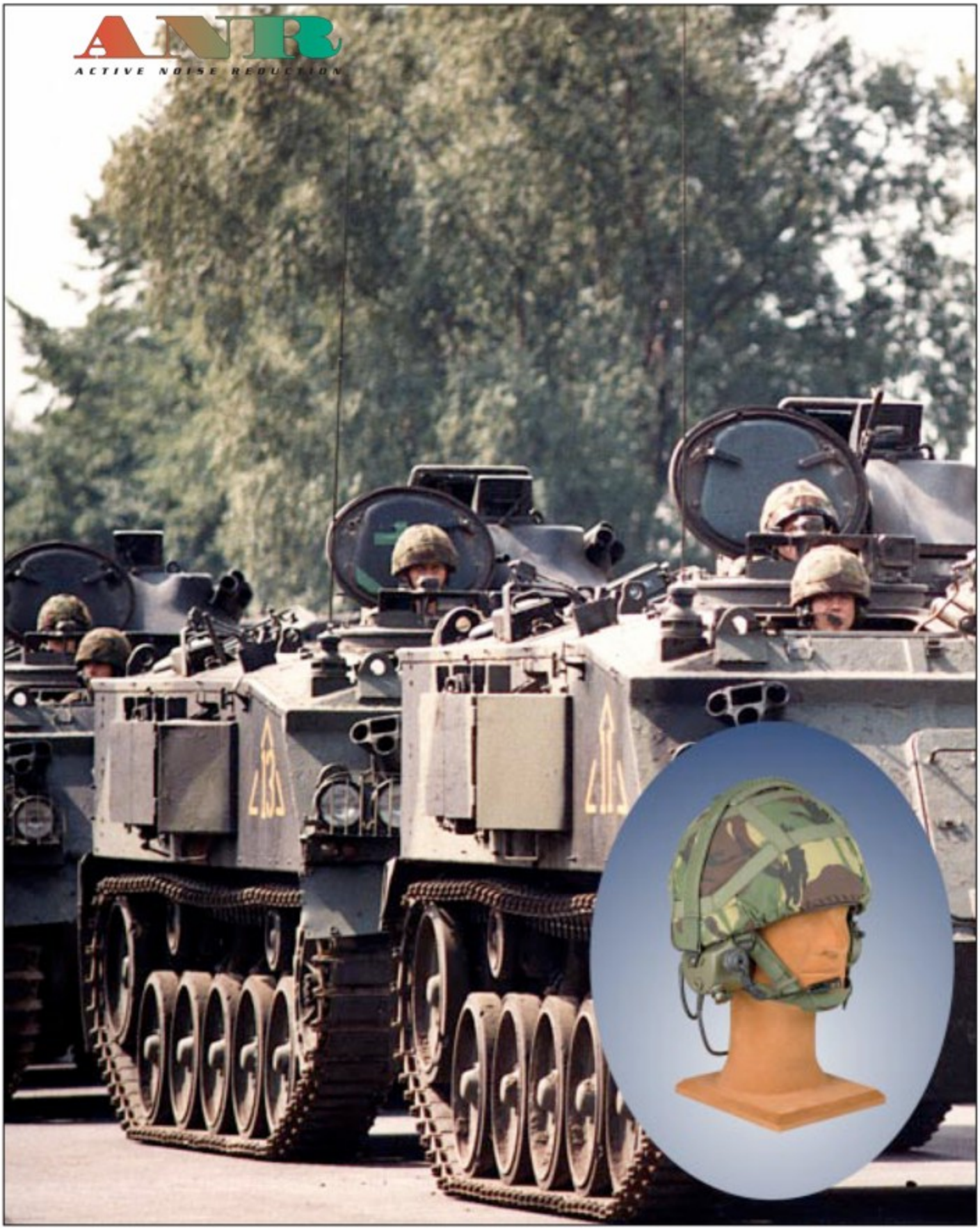
Publication No. 8033-1



RA195 COMBAT ANR HEADSET

RACAL

RA195 COMBAT ANR HEADSET

The Combat ANR Headset has been designed specifically for use by the crews of armoured vehicles and mechanised infantry. The headsets provide clear speech quality in these high noise areas.

- **Reduces AFV noise at the ear**
- **Improves operational effectiveness**
- **Improves speech intelligibility**
- **Protects users from hearing damage**
- **Reduces noise-induced fatigue**

Combat ANR Headset

The Combat ANR Headset is an advanced derivative of the very successful Warrior User Headset and is now in service with the British Army in all mechanised infantry vehicles.

The headset comprises two low-profile earshells, connected by a spring neckband, a soft headstrap and a fully adjustable boom microphone.

The earshells, which are moulded in high density ABS for maximum passive noise reduction, are contoured to meet the compatibility requirements of most infantry helmets. The cushions are bi-dynamic foam construction and have been carefully designed to provide maximum conformity with the profile of the users head while retaining the correct compliance for optimum low frequency passive attenuation.

The neckband comprises a fully adjustable steel band and stirrup

The Headset has been designed for compatibility with soldiers equipment, including the Mk6 combat helmet, clothing and weapon sights.

With an external power source, such as a squad radio or battery pack, the headset can be worn in the dismounted role, particularly where noise protection is required.

PRODUCT DESCRIPTION

arrangement to accomodate all head sizes between the 5th and 95th percentile, without degradation of acoustic performance. The neckband force is sufficient to maintain a good acoustic seal in the extremes of bump and vibration experienced in a vehicle, but is compliant with the needs for long term user comfort.

An adjustable headstrap locates the earshells correctly over the ears. The strap can be fitted over or under the helmet and incorporates Velcro strips for simple adjustment and for rapid attachment and removal.

Active Noise Reduction

To improve the noise reduction at the lower frequencies, each earshell contains an independent ANR module to provide both communications and noise cancellation.

The ANR module comprises a surface mount circuit board incorporating the noise cancelling electronics, a sensor microphone to detect the noise in the earshell and two earphones, one for acoustic cancellation and the other for communications. The use of two earphones in each module provides a reversionary or failsafe capability, such that the headset can be used as a conventional headset in non ANR situations or in the event of a power or electronic failure.

Boom Microphone

The headset is fitted with a boom-mounted, high quality, noise-cancelling microphone, which provides discrimination between close speech and high levels of ambient noise in the AFV environment. The boom assembly is fully adjustable and wind noise protection is provided by an expanded plastic foam microphone cover. A socket is provided on the earshell for a respirator microphone to be connected.

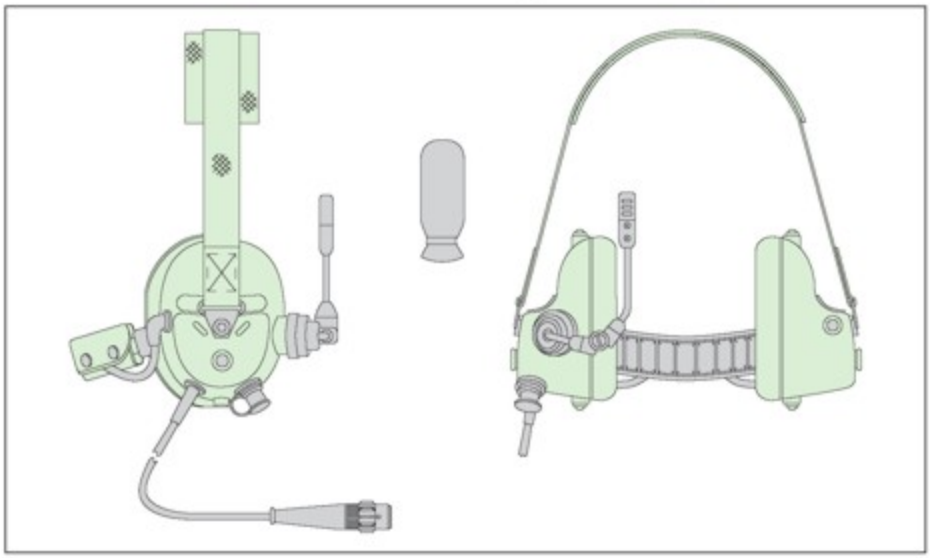
Voice Operated Switch (VOS)

An optional voice switching module is available, which is activated only when the crewman speaks. This provides a "hands-free" communications facility and minimises crew noise exposure during "live microphone" operations. The switching threshold is self-tracking and constantly adjusts to suit the noise environment. The module can be integrated inside the headset and features a "low noise inhibit" facility, which bypasses the system if the background noise is below a safe level.

If required, the VOS can be supplied to attenuate the microphone signal instead of switching off completely in order to provide the crew with greater local awareness.

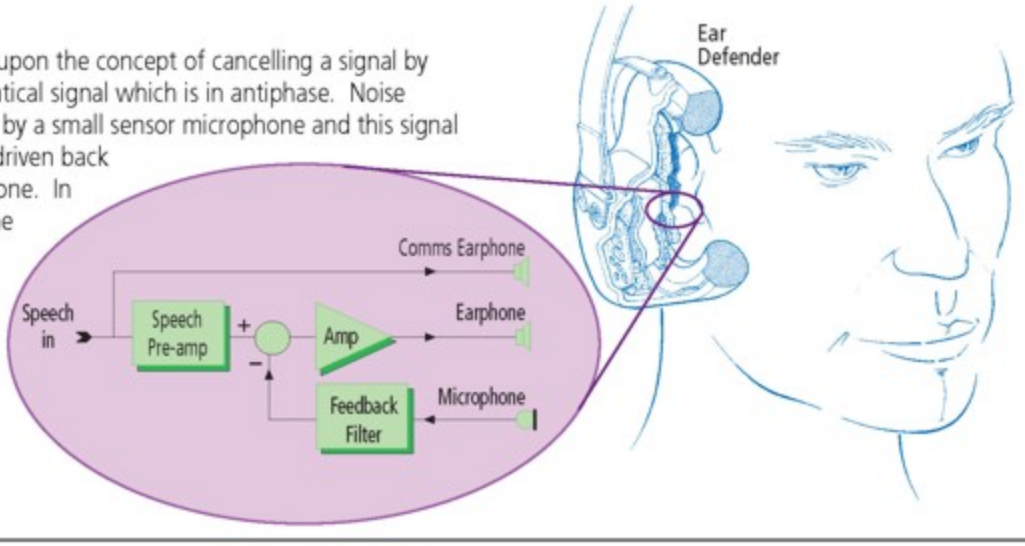
Electronic Valve

The new Racal electronic valve or "Talk Through Circuit" (TTC) replaces the more traditional mechanical vave for local awareness. Sounds or speech in the vicinity of the user are detected by microphones, mounted on the outside of each earshell, and are then regenerated, binaurally, through both headset earphones to retain directionality. The output is electronically controlled by a compression circuit to ensure that the level does not exceed the recognised health and safety limit of 85 dB(A).



ANR PRINCIPLE

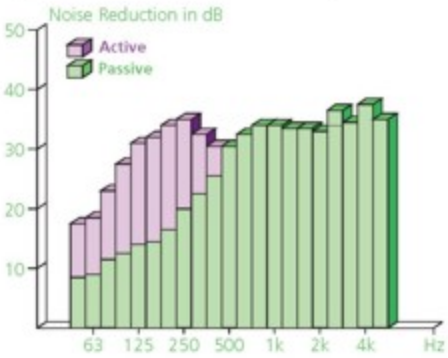
The principle of ANR is based upon the concept of cancelling a signal by superimposing upon it an identical signal which is in antiphase. Noise within the earshell is detected by a small sensor microphone and this signal is then inverted in phase and driven back into the earshell via the earphone. In this way more than 97% of the low frequency noise energy entering the earshell will be cancelled. Any speech signals detected by the sensor microphone are electronically processed and are not affected by the cancellation.



TECHNICAL SPECIFICATIONS

HEADSET ATTENUATION DATA

Typical Headset Performance Figures



Noise Reduction

The semi-subjective attenuation characteristics of the Combat ANR Headset, when properly fitted, are typically as shown below:-

	Attenuation (dB)	
Frequency (Hz)	**Passive**	**Active**
63	9	10
125	14	17
250	20	15
500	30	
1k	34	
2k	33	
4k	35	

ELECTRO-ACOUSTIC DATA

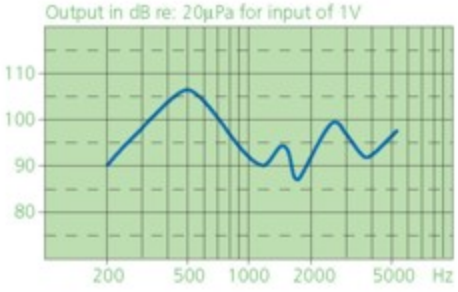
Earphone and microphone measurements are made as described in publication 8133.

Earphones

Transducer part no: RA1020/1001

Transducer type: ANR module

Typical frequency response:



Sensitivity: 98dB SPL (re: 20µPa)/V rms at 1kHz nominally

Impedance: each earshell 300ohms at 1kHz nominally

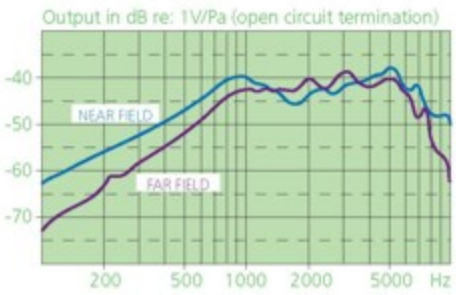
Boom Microphone Options

Transducer part no: 25690

Transducer type: noise cancelling moving coil

Sensitivity: -61dB re 1V/Pa, open circuit at 1kHz, nominally

Typical frequency response:



Impedance: 200 ohms at 1kHz, nominally

Noise cancelling performance: difference in output level of nominally 14dB at 200Hz between near field and far field (i.e. at 1m from source)

Transducer part no: 25740

Transducer type: noise cancelling moving coil

Sensitivity: -72dBV/Pa at 1kHz nominally, when terminated by a 300 ohm resistive load

Typical frequency response: when connected to headset interface circuit

Impedance: 300 ohms at 1kHz, nominally (as seen via plug)

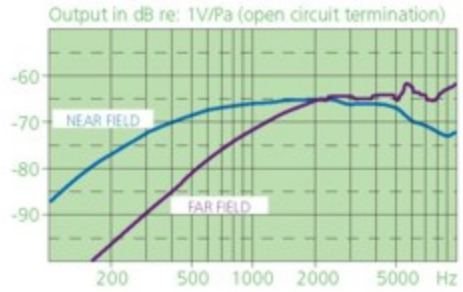
Noise cancelling performance: difference in output level of nominally 14dB between near field and far field (i.e. at 1m from source) at 200Hz

Transducer part no: 554285

Transducer type: noise cancelling electret

Sensitivity: -66dB re 1V/Pa at 1kHz, nominally, when terminated in an impedance of 300ohms and measured through headset VOS circuit

Typical frequency response:



Noise cancelling performance: difference in output level of nominally 19dB at 200Hz between near field and far field (i.e. at 1m from source)

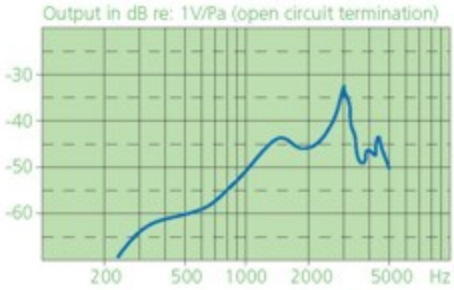
Respirator Microphone Option

Transducer part no: RA430

Transducer type: rocking armature

Sensitivity: -51dB re 1V/Pa, open circuit at 1kHz nominally

Typical frequency response:



Impedance: 68ohms at 1kHz nominally, seen via plug

Connector: 3-pin pattern 105

ELECTRICAL DATA

Power Supply

The Combat ANR Headset can be powered from a vehicle harness, radio or external power source.

Voltage: 18 to 28V dc

Current: quiescent: 30mA; typical noise; 50mA; peak transients: 150mA

Switches

A variety of in-line Press-to-talk (PTT) switches are available. Customer to detail wiring of switches.

Cables

A variety of both straight and coiled cables to Military Standards can be supplied to suit customer requirements.

PHYSICAL DATA

Environmental

Usage temperature: -30°C to +55°C

Storage temperature: -40°C to +70°C

Humidity range: Up to 95% RH

Mass: 750g

Helmet Compatibility

The Combat ANR Headset is compatible with a wide range of infantry helmets, including the British Army GS Mk 6.

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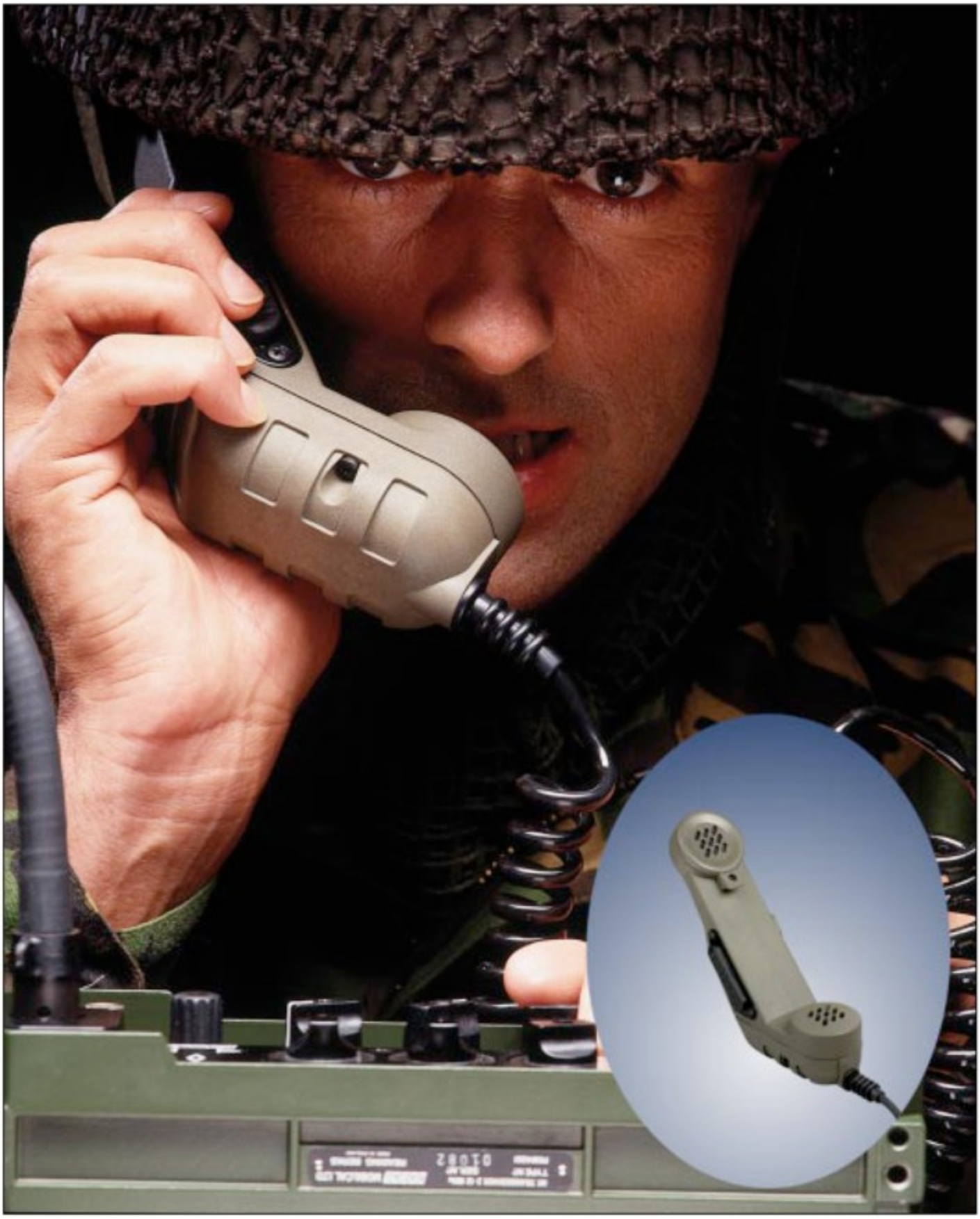
Publication No. 8036-1



RA250 SLIMLINE HANDSET

RACAL

RA250 SLIMLINE HANDSET

- **Flexible in configuration**
- **Functional in hostile environments**
- **Rugged and waterproof in construction**
- **Economic in equipment design**
- **Aesthetic in appearance**

Recent developments in electronics technology, resulting in miniaturization of military and commercial radio equipment, have placed new criteria on handset design.

Significant among recent changes is the need to provide control functions on the handset in addition to , or instead of, the radio front panel.

Light, tough, and ergonomically styled, RA250 can incorporate traditional PTT switches, rotary and keypad controls and the base of the handset can accommodate customer specified electronics.

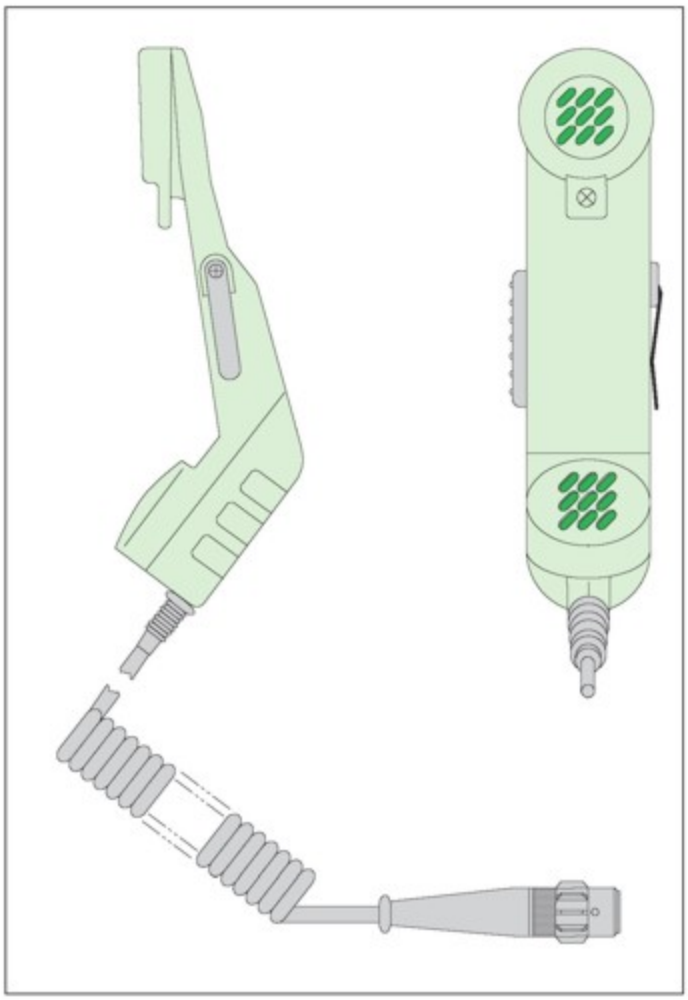
PRODUCT DESCRIPTION

The advanced RA250 Series Handset is built to the highest international requirements. Its modular construction contained within a rugged housing ensures the widest flexibility designed to meet the needs of each user. The high level of specifications of every module ensures that the resulting handset maintains its compliance with the most stringent standards for strength, operation and reliability.

The slim profile of the earpiece ensures that the RA250 Series Handset can be used in conjunction with a protective helmet. A wide range of microphone and earphone impedances and sensitivities are available.

Important in the design of the RA250 Series has been the attention given to the current demands of equipment designers to incorporate control and optional electronic circuitry within the handset. Control can be rotary or keypad, with applications ranging from simple volume adjustments to control of radio functions such as channel, mode, power, encryption and frequency agility. An LED display can also be incorporated.

Uncommitted space within the base of the handset can be used to package circuitry incorporating amplifiers, keypad encoders, encryption devices or selective calling modules powered directly from the equipment. The RA250 Series has been conceived for reconfiguration by imaginative equipment designers, providing a range of options, not normally included with the main equipment, and thus leading to new applications. The Series is available in a range of colours: olive drab, black, desert sand and red. Other colours can be provided to special order.



TECHNICAL SPECIFICATIONS

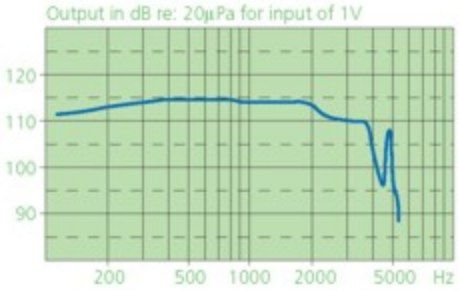
ELECTRO-ACOUSTIC DATA

Earphone and microphone measurements are made as described in publication no. 8133-1.

Earphones

The thin earphones are designed to enable the handset to be used in conjunction with most military and safety helmets.

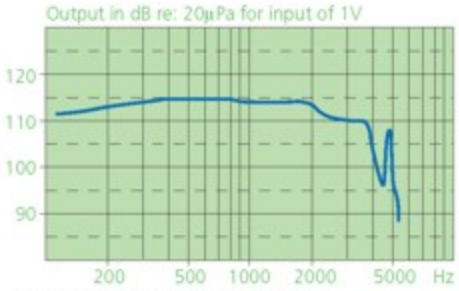
Transducer part no: 27160
Transducer type: rocking armature earphone
Nominal sensitivity: 19dB re 1Pa/mW
Frequency response: measured via the handset



Impedance: 300ohms ±25% at 1kHz

Transducer part no: 27172
Transducer type: rocking armature earphone
Nominal sensitivity: 19dB re 1Pa/mW
Impedance: 150ohms ±25% at 1kHz

Transducer part no: 27195
Transducer type: rocking armature earphone
Nominal sensitivity: 19dB re 1Pa/mW
Frequency response: measured via the handset



Impedance: 600ohms ±25% at 1kHz

Transducer part no: 27154
Transducer type: rocking armature earphone
Nominal sensitivity: 19dB re 1Pa/mW
Impedance: 1,000ohms ±25% at 1kHz

Transducer part no: 27161
Transducer type: rocking armature earphone
Nominal sensitivity: 19dB re 1Pa/mW
Impedance: 2,400ohms ±25% at 1kHz

Microphones

Sensitivities quoted for microphones loaded with a matched impedance, measured at 1kHz using a B & K 4219 voice.

Microphones have a sharply rising response in the range 200 - 900Hz approx. and cut off above 3.4kHz approx. The effect is to suppress typical industrial and military noise which is predominantly low frequency in character.

Transducer part no: 27160
Transducer type: rocking armature microphone. Larkspur compatible.
Nominal sensitivity: -56dB re 1V/Pa
Impedance: 300ohms at 1kHz.

Transducer part no: 27170
Transducer type: rocking armature microphone. Clansman compatible.
Nominal sensitivity: -66dB re 1V/Pa
Impedance: 300ohms at 1kHz.

Transducer part no: 27155
Transducer type: rocking armature microphone. Standard US compatible.
Nominal sensitivity: -64dB re 1V/Pa
Frequency response:

Impedance: 150ohms at 1kHz

Transducer part no: 27161
Transducer type: rocking armature microphone.
Nominal sensitivity: -47dB re 1V/Pa.
Impedance: 2,400ohms at 1kHz.

ELECTRICAL DATA

Switches

A variety of in-line Press-to-talk (PTT) switches are available (refer technical leaflet TS 7264). Customer to detail wiring of switches.

Cables

A variety of both straight and coiled cables to Military Standards can be supplied to suit customer requirements (refer technical leaflet TS 7265)

PHYSICAL DATA

Environmental

Usage temperature: -40°C to +55°C
Storage temperature: -40°C to +70°C
Humidity: 5 cycles of 48 hours in accordance with MIL-STD-810, Method 507
Altitude (operating): Up to 3000m above sea level with max. 5dB degradation
Vibration: MIL-STD-202, Method 201
Drop: 10m drops through 1.5m onto concrete with max. 5dB degradation
Bump: 4,000 bumps of 40g
Immersion: 1m for 2 hours
Blast: 30 rounds at peak pressure 62kN/m² with max. 3dB degradation

Dimensions & Mass

Height: 217mm
Width: 46mm
Depth: 78mm max
Mass: 370g (typical)

Materials & Colour

Material: Glass-loaded Nylon
Colours: Olive drab, black, desert sand or red.

Stowages

Two types of secure stowage are available, both switched and unswitched.

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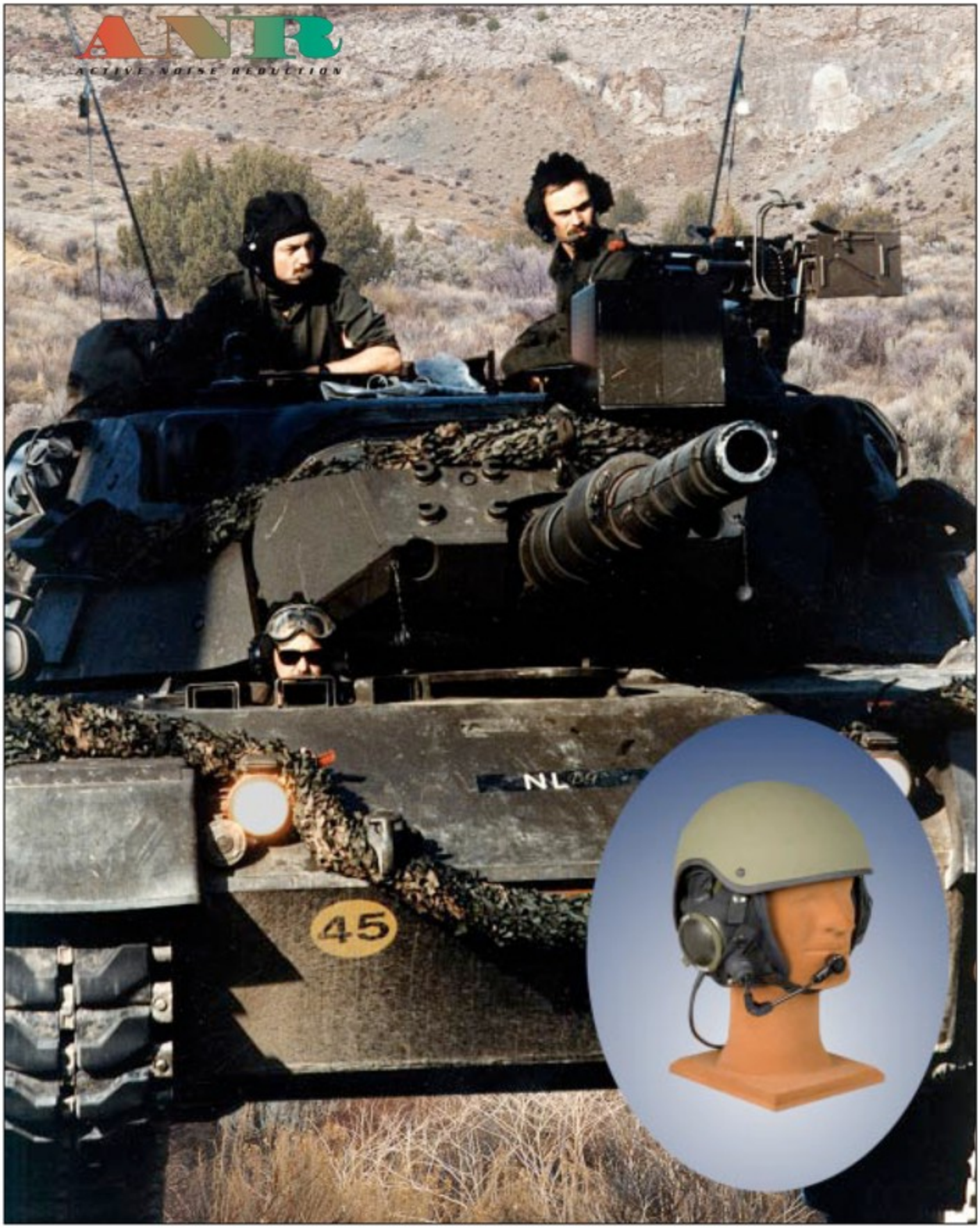
Publication No. 8018-1



RA310 Ventilated Tank Helmet (VTH)

RACAL

RA310 Ventilated Tank Helmet (VTH)

The hard helmet shell can be provided with a range of bump/ballistic protection levels.

- **Detachable protective shell**
- **Ventilated fabric liner**
- **Talk-through facilities**
- **Protects users from hearing damage**
- **Active noise reduction available**

Helmet

VTH is a two piece helmet designed specifically to provide maximum impact protection, combined with maximum comfort, particularly in hot climates. First, there is a lightweight cotton drill, ventilated soft helmet with closed cell foam strips to provide the impact protection. Second, there is a hard helmet shell, which attaches to the top of the soft helmet to provide additional protection, while still retaining full ventilation over the head. For logistic simplicity, the single size helmet is designed to fit most heads by means of simple strap adjustments.

Particular design consideration has been given to ensuring compatibility of VTH with various weapon systems.

In addition to acoustic protection VTH meets the need to provide vehicle crewmen with some protection from head injury due to bumps or impact with the vehicle interior. The VTH can be worn with the hard helmet in place or detached.

PRODUCT DESCRIPTION

Headset

The helmet incorporates mountings for a headset, which is designed to give good noise protection and to provide good communications even under high noise conditions.

The standard headset is fitted with a boom-mounted , high quality, noise-cancelling microphone, which provides discrimination between close speech and high levels of ambient noise. Optional types of boom microphone are available, miniature moving coil magnetic and an electret type; a throat microphone is also available. If required, an optional Voice Operated Switch can be incorporated in the headset to further reduce the noise exposure in 'Live Intercom' situations.

VTH Options

Active Noise Reduction

Even with the excellent passive attenuation offered by the VTH earshell, the very high noise levels that are associated with modern armoured vehicles can still cause crew fatigue, poor communications intelligibility and hearing damage.

To resolve this situation, Racal Acoustics provide Active Noise Reduction (ANR) technology. The ANR system, described below, is conveniently enclosed in modules which are fitted into both earshells. Racal Acoustics are world leaders in the production of ANR for Armoured Fighting Vehicles.

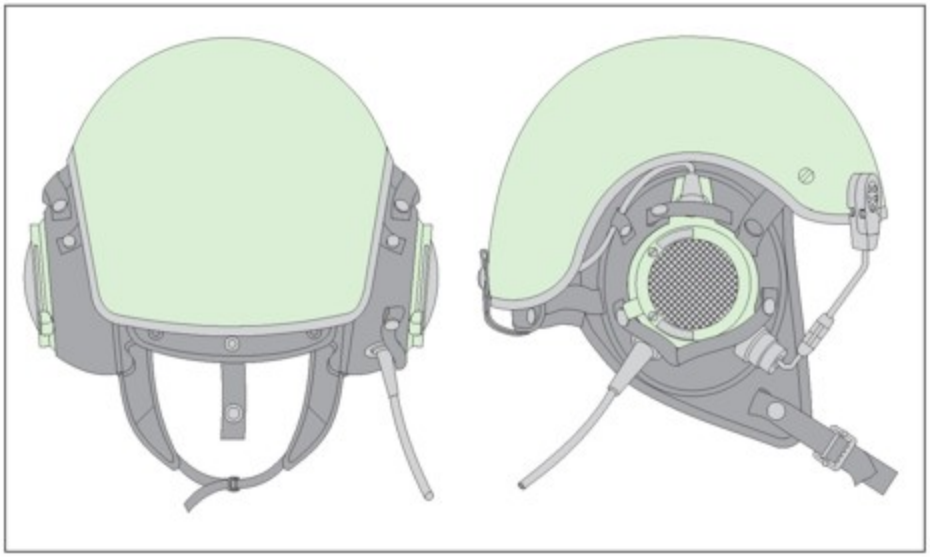
Talk-through

The standard VTH is fitted with the unique Racal Acoustics patented acoustic valve. This simple mechanical device, which needs no power supply, provides the user with the choice of full attenuation, with the valve closed, or the reception of natural airborne sounds such as speech or warnings with the valve open. An explosive sound attenuator protects the wearer from high level impulse noise, even with the acoustic valve open.

Where power is available, the talk-through facility can be provided using an electronic valve. When switched on microphones on each earshell feed external sounds to the ear via an amplifier, which ensures that the sound level does not exceed the Health and Safety limit of 90dB(A).

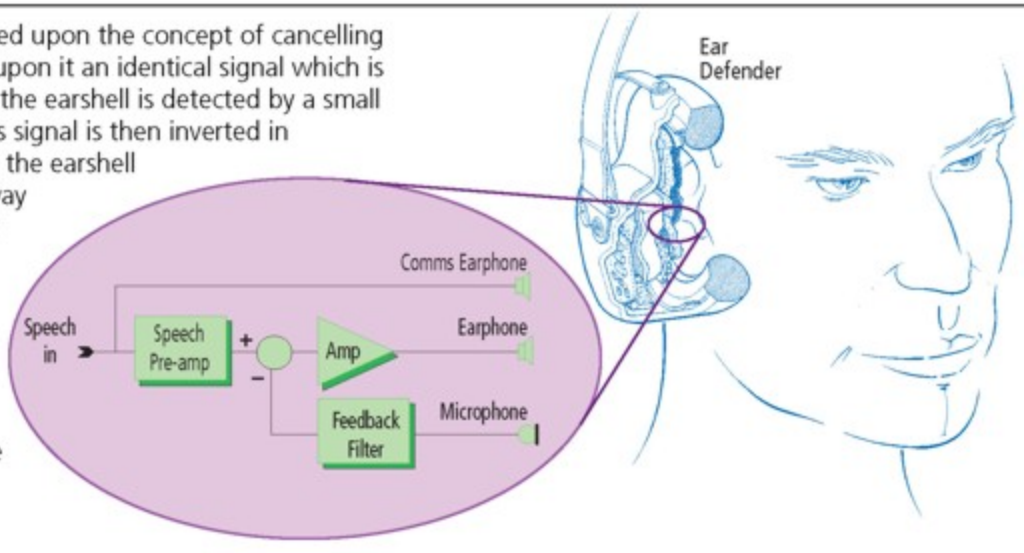
Other Options

In addition to the optional equipment described above, Racal Acoustics can also provide an extensive range of cables, plugs and PTT switches depending on user requirements. The hard shell is also available in desert sand and black as options to the standard colour of drab olive green.



ANR PRINCIPLE

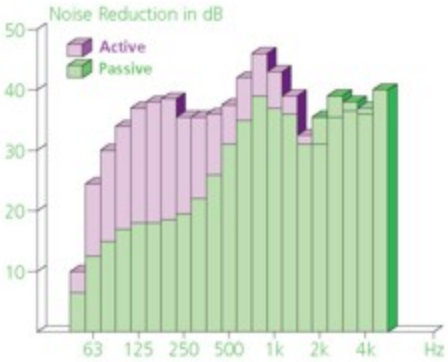
The principle of ANR is based upon the concept of cancelling a signal by superimposing upon it an identical signal which is in antiphase. Noise within the earshell is detected by a small sensor microphone and this signal is then inverted in phase and driven back into the earshell via the earphone. In this way more than 97% of the low frequency noise energy entering the earshell will be cancelled. Any speech signals detected by the sensor microphone are electronically processed and are not affected by the cancellation.



TECHNICAL SPECIFICATIONS

HEADSET ATTENUATION DATA

Typical Headset Performance Figures



Noise Reduction

The semi-subjective attenuation characteristics of the ANR Headset, when properly fitted, are typically as shown below:-

Frequency Hz	Attenuation dB Passive	Active
63	15	12
125	17	19
250	20	16
500	32	6
1k	37	5
2k	35	-
4k	38	-

ELECTRO-ACOUSTIC DATA

Earphone and Microphone measurements are made as described in publication 81xx.

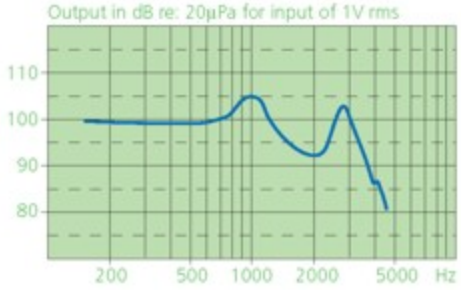
Earphones

Transducer part no: 19575/1

Transducer type: high power earphone

Sensitivity: 95dB re 2 x 10^{-5} Pa for 1mW to each earphone at 1kHz (in earshell). Measured on B & K 4153 Artificial Ear.

Frequency response:



Impedance: 300 ohms ±25% at 1kHZ (each earphone).

Climatic: Fully tropicalized.

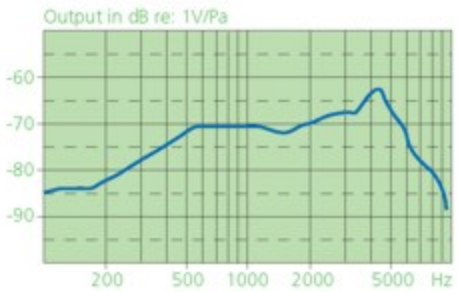
Boom Microphones

Transducer part no: 25690

Transducer type: miniature noise cancelling moving coil microphone

Sensitivity: -61dB re 1V/Pa, open circuit at 1kHz. Measured with B & K 4219 Voice.

Frequency response:



Impedance: 200 ohms ±20% at 1kHz.

Climatic: Fully tropicalized.

Compatibility with carbon microphone systems is provided by an integral pre-amplifier which retains the improved noise cancelling and speech quality of this microphone.

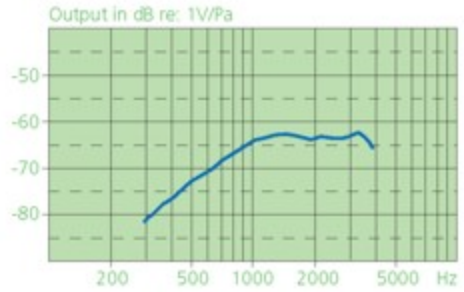
An ancillary socket can be fitted (either with or without the boom microphone) to accept a plug from a suitable throat or respirator microphone.

Transducer part no: 13750

Transducer type: tropicalized noise cancelling magnetic microphone

Sensitivity: -64dB re 1V/Pa at 1kHz.

Frequency response:



Impedance: 300 ohms

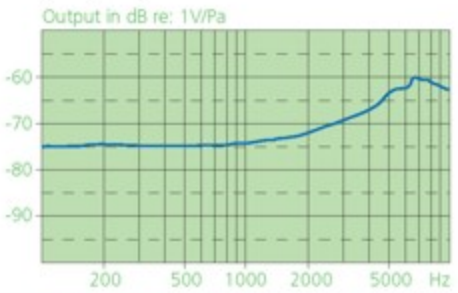
Noise cancellation: Approx. 35dB at low frequencies, reducing in effect as the frequency increases and reverting to normal pressure operation at 3.2kHz.

Transducer part no: 8600

Transducer type: miniature noise cancelling electret microphone

Sensitivity: -76dB re 1V/Pa at 1kHz, when terminated in an impedance of 300 ohms.

Frequency response:



Compatibility with carbon microphone systems is provided by the recommended pre-amplifier type 23535, which retains the noise cancelling properties and improved speech quality of the microphone.

Power supply: 3 to 30V dc with a current of less than 0.5mA.

ELECTRICAL DATA

Switches

In-line and earshell switches can be supplied to suit customer requirements.

Cables

A variety of both straight and coiled cables to military standards are available.

PHYSICAL DATA

Mass

Mass: 850g

Environmental

Designed to meet the requirements of Defence Specification DEF 133 Category L3, Ground Equipment .

Usage temperature: -30°C to +55°C.

Storage temperature: -40°C to +70°C.

Humidity range: up to 95% RH

Head Protection

Helmet with anti-fragment shell in position.

Bump impact: Meets the requirements of TLA-084. Applied energy 15NM. Max. transmitted force 5kN.

Penetration: The helmet, with the anti-fragment shell in position, is not pierced or greatly indented by the impact of a spherical steel projectile of 6.35mm dia. at a velocity of 130m/s.

N.B. Shells with higher protection levels are also available

Compatibility with Vehicle Systems

Sighting systems: Helmets providing impact protection often impede access to the gun sighting system. VTH can be used without the anti-fragment shell, inside the tank, and therefore give free access to the gunsight without modification.

Communications: Connection to the vehicle system can be supplied for use with the British Army, the Racal 400/600, the American ANVRC or other harnesses.

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Publication No. 8040-1

RA315 INTEGRATED HELMET SYSTEM (IHS)

RACAL

RA315 INTEGRATED HELMET SYSTEM (IHS)

The Integrated Helmet System combines a universal, one size soft helmet with an advanced communications headset offering a range of high technology features.

- **Universal, one size helmet**
- **Reconfigurable for mission profiling**
- **Full ballistic protection**
- **Optional noise reduction technologies**
- **Future enhancement capability**

As a result of the rapid evolutionary changes in battlefield technology, the adoption of technologically advanced equipment is of paramount importance if combat effectiveness and military superiority are to be maintained. If the threat or the operational scenario changes, however, or if new technologies become available, equipment which was designed for a specific role may no longer be as effective or even appropriate to the new situation. Recognizing the importance of this problem, Racal has developed a new Integrated Helmet System, which is reconfigurable, to follow changes in operational role and can be upgraded in the event of technological changes.

Integrated Helmet System

The Integrated Helmet System is based on a soft ventilated helmet with a compatible range of ballistic protective shells, communications headsets, noise reduction systems and speech intelligibility enhancements specifically designed to suit the needs of AFV crews.

The system comprises three major elements; the soft ventilated helmet, the ballistic protective shell and the communications headset, each of which is easily separable to facilitate reconfiguration and maintenance. Both the headset and the helmet can be worn as separate items, if required.

In "closed-down" combat situations, the soft helmet provides excellent bump protection together with good ventilation, noise protection and clear communications, yet still allows unimpeded access to weapon sights.

In "head-out" situations, a range of ballistic shells can be clipped to the soft helmet, to combat the appropriate threat level.

PRODUCT DESCRIPTION

Ventilated Soft Helmet

The Soft Helmet is a universal, one size helmet which is easily adjustable to suit any user. It is constructed from a soft composite material which combines comfort with maximum bump protection and demonstrates excellent ventilation properties for hot environments. The soft helmet is an excellent bump protector but additional protection can be provided by adding a clip-on hard outer shell offering ballistic protection.

Ballistic Shell

The Ballistic Shell is a one size protective hard top which can be attached to the inner soft helmet to provide a much greater degree of protection. Three protection levels are available commencing with the basic Fragmentation Shell which is intended to provide protection against low velocity effects such as shrapnel or fragmentation at up to 130m/s. The Medium Velocity Ballistic Shell, made of Aramid material, provides a significantly higher level of protection, achieving a V50 figure of 430 m/s.

To combat the threat of new, high velocity weapons the High Velocity Ballistic Shell can be employed, which provides protection up to 670m/s. The helmet shells are fully inter–changeable and allow an upgrade path in the event that the operational threat level changes.

Communications Headset

Two headset styles are available, one for dedicated vehicle crews, the other being an optional low profile version for mechanised infantry. The headsets provide full communications facilities and are designed for optimum noise attenuation properties. The provision of an adjustable sprung neckband and an overhead strap also allows the headset to be worn separate from the helmet.

With the high levels of noise inherent in AFVs, Racal offers a wide range of optional noise reduction technologies which the customer can select, if appropriate, for his particular operational scenario and which are fully integrated within the headset.

Acoustic Valves

Mechanical Valve

In some operational situations total noise exclusion can be a disadvantage, particularly if the user has to maintain an awareness of his surroundings. An acoustic valve provides the option to receive external airborne sounds, when required. The Racal mechanical acoustic valve provides this facility in addition to blast protection which attenuates sudden explosive sounds.

Electronic Valve

Where power is available the new Racal electronic valve or "Talk Through Circuit" (TTC) provides a similar function electronically. Sounds or speech in the vicinity of the user are detected by microphones, mounted on the outside of each earshell, and are then regenerated, binaurally, through both headset earphones to retain directionality. The output is electronically controlled by a compression circuit to ensure that the level does not exceed the recognised health and safety limit of 85 dB(A).

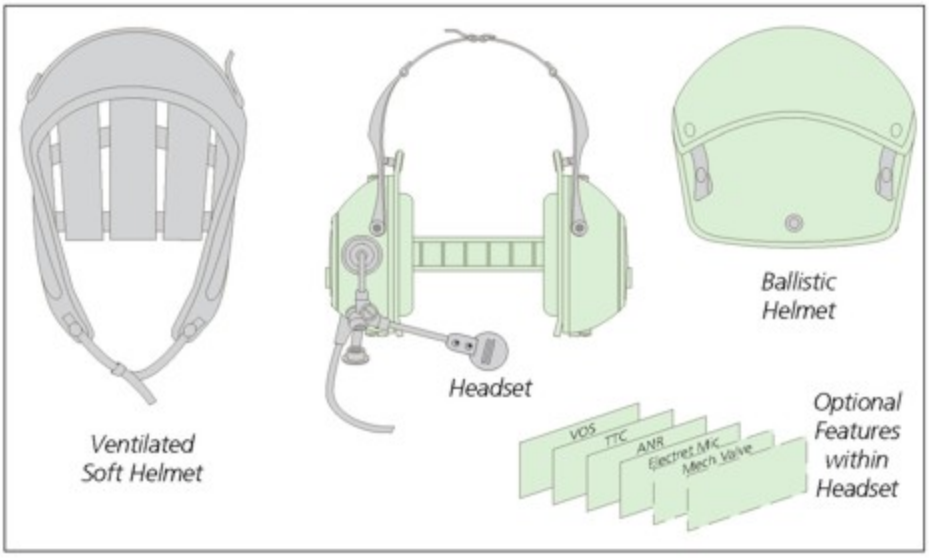
Voice Operated Switch (VOS)

An optional voice switching module is available, which is activated only when the crewman speaks. This provides a "hands-free" communications facility and minimises crew noise exposure during "live microphone" operations. The switching threshold is self-tracking and constantly adjusts to suit the noise environment. The module can be integrated inside the headset and features a "low noise inhibit" facility, which bypasses the system if the background noise is below a safe level.

If required, the VOS can be supplied to attenuate the microphone signal instead of switching off completely in order to provide the crew with greater local awareness.

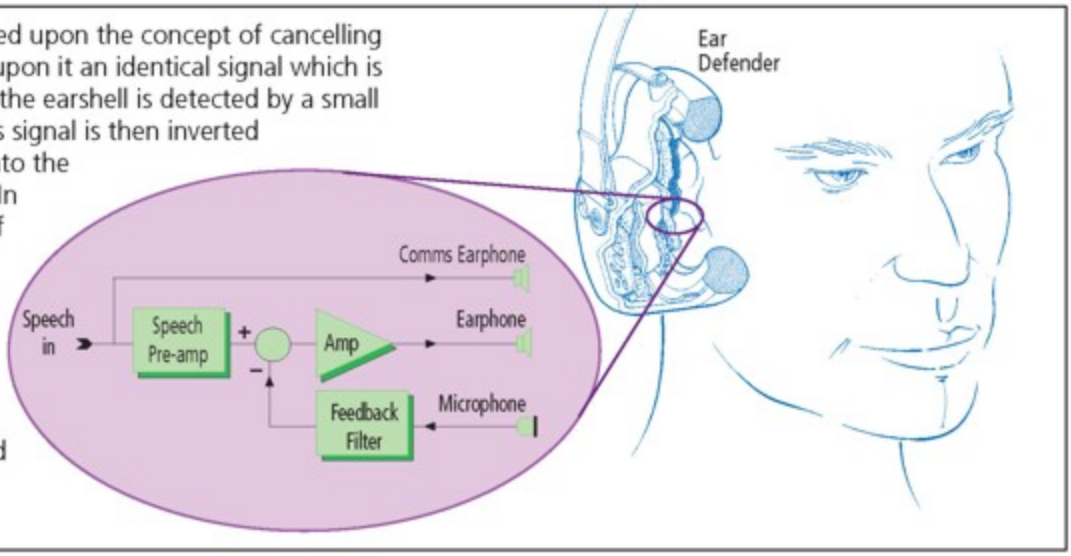
Boom Microphone

A range of noise cancelling boom microphones is available including a new electret type which has excellent speech clarity and improved low frequency noise protection.



ANR PRINCIPLE

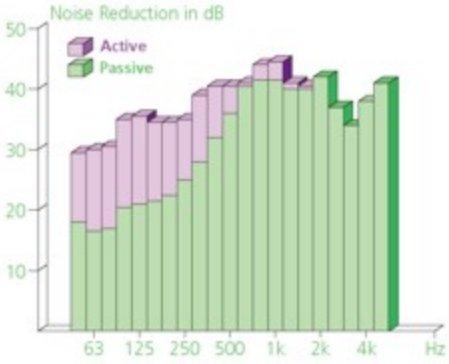
The principle of ANR is based upon the concept of cancelling a signal by superimposing upon it an identical signal which is in antiphase. Noise within the earshell is detected by a small sensor microphone and this signal is then inverted in phase and driven back into the earshell via the earphone. In this way more than 97% of the low frequency noise energy entering the earshell will be cancelled. Any speech signals detected by the sensor microphone are electronically processed and are not affected by the cancellation.



TECHNICAL SPECIFICATIONS

HEADSET ATTENUATION DATA

Typical Headset Performance Figures



Noise Reduction

The semi-subjective attenuation characteristics of the ANR Headset, when properly fitted, are typically as shown below:-

	Attenuation (dB)	
Frequency (Hz)	**Passive**	**Active**
63	16	14
125	21	15
250	25	10
500	36	5
1k	41	3
2k	42	-
4k	38	-

ELECTRO-ACOUSTIC DATA

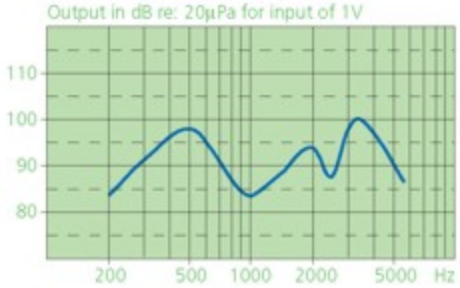
Earphone and microphone measurements are made as described in publication no. 8133.

Earphones

Transducer part no: RA1020/1001

Transducer type: ANR module

Typical frequency response:



Sensitivity: 85dB SPL (re: 20µPa)/V rms at 1kHz nominally

Impedance: each earshell 300 ohms at 1kHz nominally

Boom Microphone Options

Transducer part no: 25740

Transducer type: noise cancelling moving coil

Sensitivity: -65dBV/Pa at 1kHz nominally, when terminated by a 300 ohm resistive load

Typical frequency response: when connected to headset interface circuit

Impedance: 300 ohms at 1kHz, nominally (as seen via plug)

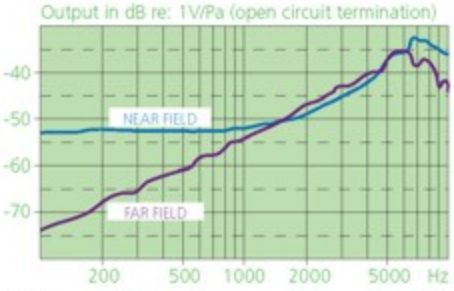
Noise cancelling performance: difference in output level of nominally 14dB between near field and far field (i.e. at 1m from source) at 200Hz

Transducer part no: 8600

Transducer type: noise cancelling electret

Sensitivity: -74dB re 1V/Pa at 1kHz, nominally, when terminated in an impedance of 300 ohms and powered by 10V via 4k7 ohms

Typical frequency response:



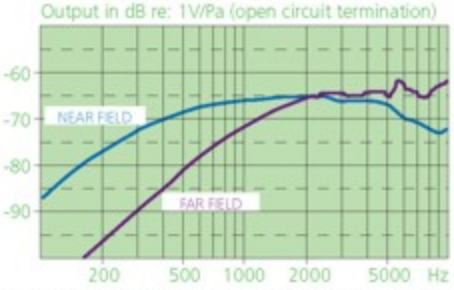
Noise cancelling performance: difference in output level of nominally 19dB at 200Hz between near field and far field (i.e. at 1m from source)

Transducer part no: 554285

Transducer type: noise cancelling electret

Sensitivity when used with VOS and terminated into 300 ohm load: -66dB re 1V/Pa at 1kHz, nominally, when used with VOS and terminated into a 300 ohm load

Typical frequency response:



Noise cancelling performance: difference in output level of nominally 19dB at 200Hz between near field and far field (i.e. at 1m from source)

ELECTRICAL DATA

Communications

Headsets can be offered which are compatible with a wide range of radio equipment and vehicle harness systems.

Power Supply

The IHS Communications Headset can be powered from a vehicle harness, radio or external power source.

Voltage: 18 to 28V dc

Current: VOS <10mA, TTC <10mA, ANR quiescent: 30mA; typical noise; 50mA; peak transients: 150mA

Electret Microhone: <1mA when powered in a 4k7 load resistor

Switches

A variety of in-line Press-to-talk (PTT) switches are available. Customer to detail wiring of switches.

Cables

A variety of military standard straight and coiled downleads and extension cables can be supplied to suit customer requirements .

PHYSICAL DATA

Environmental

Usage temperature: -30˚C to +55˚C

Storage temperature: -40˚C to +70˚C

Humidity range: Up to 95% RH

Helmet Protection

Fragmentation shell: 130m/s

Medium velocity shell: 430m/s, V50 rating

High velocity shell: 670m/s, V50 rating

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