

AZDEC LIMITED

INFRA-COM™ SYSTEM



**Infra Red
Two Way Mobile Digital Voice Systems**

SYSTEM OVERVIEW

The Infra-ComÔ System is a digital infra red communications system specifically designed for the use on ships. The Infra-ComÔ system provides mobile high quality, low noise, two way voice communications for operations on the bridge or Flyco areas and for the use by mobile operators in engine rooms, machinery spaces and operations rooms.

Infra red technology has been used for many years with various basic systems available. The Infra-ComÔ system is the first and most advanced system which has been specifically developed for the more demanding environments. The equipment is both mechanically and technologically robust with secure and proven digital encoding.

The low level infra red digital encoding eliminates ocular hazards while providing exceptional coverage with multi-channel capability. The ability to employ virtually unlimited infra red antennas, from one base station, ensures coverage over large areas and on several decks. The use of encoding similar to CCITT G.711 guarantees outstanding quality of low noise voice communications which is full duplex on each channel. Side tone is generated in the base station giving complete confidence that communication is being achieved.

The compact mobile electronics is housed within the headset, projecting less than 10mm above the normal headset height. This unique design offers unobstructed reception without restricting mobility and allows the mobile to be used in areas of restricted headroom frequently found in surface vessels and submarines.

Mobile operators can communicate between each other or with the ship's communication systems. The Flyco option allows for selective communications between a mobile user and either internal or external radio communications while receiving independent communications in each ear. This enhanced option also allows for broadcast communication to be received and local two way communications to be used independently, with the two communications channels in different ears.

Interference from electrical machinery is eliminated by the use of digitally encoded infra red, allowing two way full duplex voice communications to continue in the most arduous electrical environments found in machinery spaces and other areas of high electrical noise.

The mobile operator has the option of noise attenuating or single side headset. All options are provided with a noise cancelling microphone.

Small fixed Infra red antennas receive and transmit data between mobile users and the ship's communications. These antennas are connected on simple "daisy chain" wiring throughout the area of coverage. This allows for a simple low cost installation which can be readily extended to cover additional areas as required, which can be undertaken by unskilled personnel. Using the maximum number of antennas areas up to 7500 square metres (75,000 square feet) can be covered by a single system.

A belt mounted battery pack carries the operator interface controls, which are designed to be used while wearing protective clothing. These controls include the on/off switch, channel selection, volume control and press to talk button.

Although providing extensive life the battery pack can be rapidly removed and replaced with a recharged unit. A six channel conditioning battery charger is provided which can fully recharge a spent battery pack in under 2 hours.

Because of the low level of background noise of the digital electronics a regular confidence tone is provided to the mobile operator whenever in an area covered by infra red communications. Different tones are generated for external or internal communications.

The whole system has been designed for high reliability and availability with all MTBF calculated to the MIL-HDBK-217F.

The system has been designed to meet and has been extensively tested for both the lack of sensitivity to and the emission of electro-magnetic radiation and is capable of withstanding severe energy pulses. The equipment has been independently tested for environmental conditions, shock and vibration.

Digital infra red systems offer secure communications with a well defined area of reception, while offering the highest level of immunity to electromagnetic radiation. The system's infra red radiation is sufficiently low that it is classified as Class 1 to the International Standard EN 60825-1 and, therefore, exhibits no optical hazard.

Mobile Equipment

Noise Attenuating



Noise Attenuation Mobile Unit

The mobile unit shown is the noise attenuating version complete with the belt mounted battery pack. This belt mounted unit houses the mobile operator interface controls which are large and well spaced to allow for operation while wearing gloves.

The microphone, which can be worn on either side, is noise cancelling making it suitable for use in noisy areas.

The connection to the battery pack is by a high reliability connector and short electrical cord. The connector is retained by a thumb screw which ensures security and rapid disconnection for recharging.

The mobile unit, which can be seen on the top of the headset, both receives and transmits infra red over 360 degrees. This all round coverage, coupled with the optimum location on top of the head, ensures outstanding performance. The digital advanced technology provides crystal clear voice communications allowing for speech in the most noisy acoustic and electrical environments.

The battery pack clearly shows the mobile operator's controls. This full set of controls is used for channel selection and the internal or external option required for Flyco. Pressing the PTS button also keys automatically associated equipment such as radio transmitters. Battery life varies with the

type of use, typically a fully charged battery will last up to 16 hours of continuous use.

The mobile unit has been designed to be comfortable and suitable for many hours of continuous use.

Ultra Lightweight



Ultra Lightweight Mobile

This ultra light weight unit, which is suitable where high levels of audio noise do not exist, has many advanced features.

This unit can be provided with either a single or double sided headset. Alternatively, the headband mounted transceiver can be fitted to most types of headset which allows the operator to have the headset of their choice. The user controls are all mounted on the compact battery pack, which is fitted with a clip to allow attaching to a belt or pocket. Designed and moulded to fit the hand the battery pack allows the user to change the following:

- ◆ On Off switching.
- ◆ Channel selection.
- ◆ Press to talk.

- ◆ Volume.
- ◆ Left and right selection.

Other options can be configured.

The double sided headset allows split headset operation, where individual channels can be received in both left and right ears. The operator can select which channel to reply. This can be used for the monitoring of two independent systems or used to answer a telephone call on one side while monitoring a communications channel on the opposite ear.

This advanced unit can have up to 8 independent channels which can be selected by the operator. The transceiver mounted on top of the head band is light, weighing less than 50 grms, and provides the best possible coverage. The transceiver has been designed to provide large areas of coverage and can be used in high levels of direct sunlight.

This later technology mobile unit is fully compatible with previous Azdec infra red systems.

Base Station



Small enough to be mounted in any convenient location, the baseline unit shown measures nominally only 300 by 300 mm. Within the base station is the interfacing for the ship's analogue voice circuits and control electronics for the digital antennas, as well as the power supply for the base station and antennas. All cables are connected by glands on the bottom of the unit which insures the environmental integrity of the enclosure. To ensure high availability the base station has been specifically designed so that it can be replaced in a very short period of time.

The base station has been designed to allow the use on the wide variations of voltages which can be encountered on ship's power supplies. Antennas are supplied with stabilised and filtered power which ensure reliable operation, immunity to ship born noise, and long cable runs.

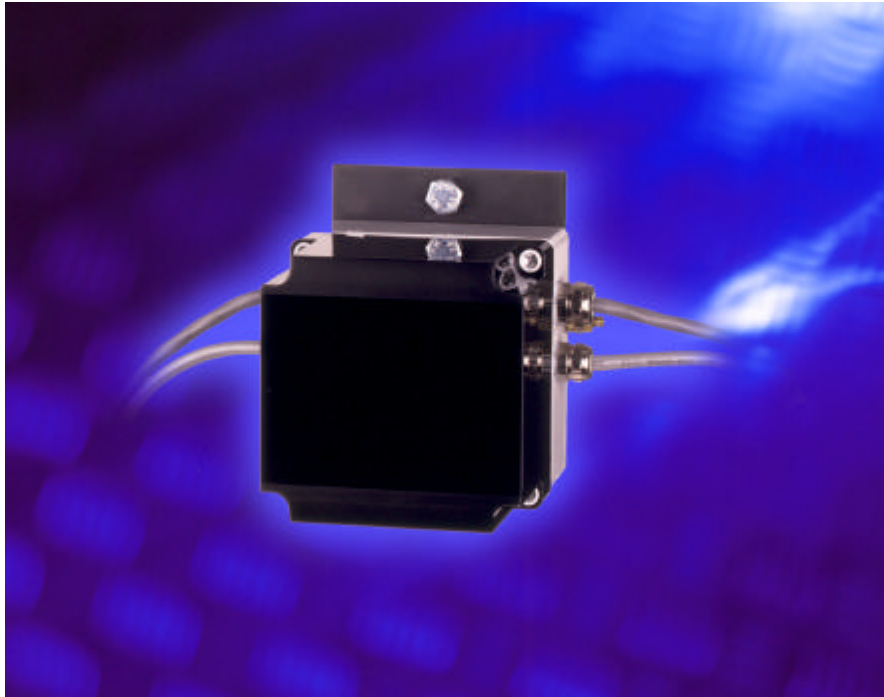
Indication is provided for "Power On", confirmation that the base station is functioning "Base Transmitting" and indication that a mobile operator is using the system "Mobile Transmitting". In addition on enhanced base stations indication is also provided when external communications have been selected.

Both internal and external mobile users can use the same base station with only the operators with the enhanced equipment having access to the external communications.

The owner can select various options for input and output analogue voltage levels and has a choice of different terminating impedances which is selected at the base station. All analogue signals are isolated from ground.

It is also possible to co-locate two systems with each systems antennas in the same area. This is achieved by connecting a simple control cable between the two base stations and nominating one base station as the "master". This allows two totally independent systems to be used within the same infra red environment.

Infra Red Antenna

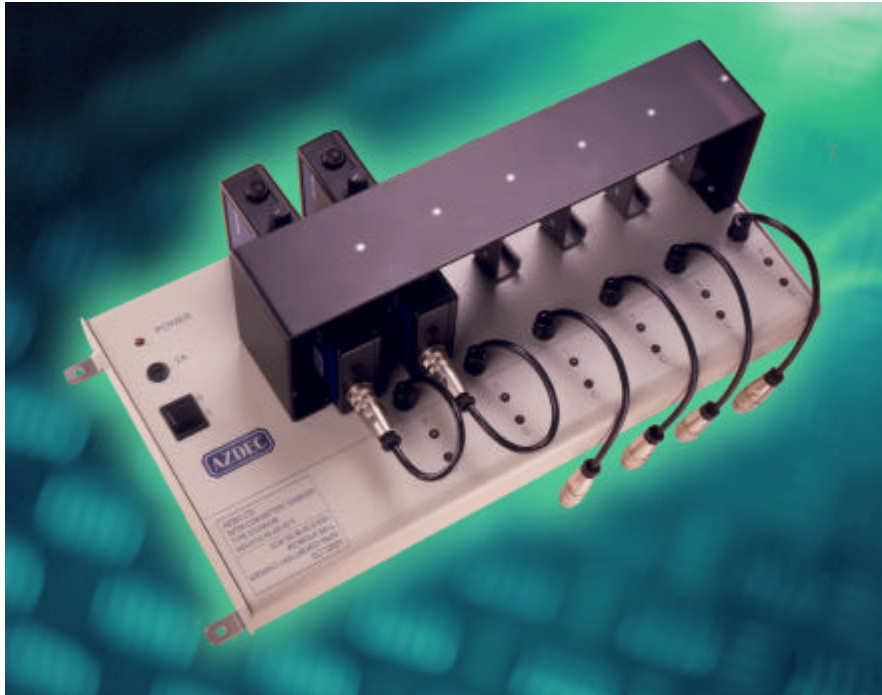


The above indicates the compact size of the antenna which is viewed from the front and shows the mounting bracket and cable glands. The body of which is only 125 by 125mm. The mounting bracket allows simple installation and ease of adjustment to ensure that the antenna can be pointed in the most appropriate direction. The use of cable glands ensures that the environmental rating is maintained.

The antenna communicates in both directions through the front cover over an angle in excess of 90 degrees with a range of up to 10 metres.

Visual indication is provided so that it can be confirmed the antenna is functioning correctly. Each antenna monitors for correct operation and automatically disconnects from the “daisy chain” in the case of a malfunction.

Battery Charger



Battery Charger with 2 Battery Packs loaded, shown in the horizontally mounted position. The charger can also be used fixed to a vertical surface when it becomes viewed from the opposite direction.

The belt mounted battery pack is securely slid into the 6 way battery charger which can be wall or desk mounted. Using the same connector as the mobile unit the charger automatically conditions the battery pack before completing a rapid recharge in normally less than 2 hours. Visual indication of the battery status is provided on an individual basis by panel mounted indicators.

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