

AZDEC LTD

USER INSTRUCTIONS
FOR
WORKS ORDER No. EXAMPLE

(EXAMPLE)

Two Way Infra Red Communications System

(TWIRC)

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AZDEC LIMITED

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Amendment Record

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1. Introduction

The Two Way Infra-Red Communication System is a system designed to allow the user to be mobile in an area and to maintain communication with other users of the TWIRC system and users of the Ship's Communication system.

Each TWIRC user will have a Headset & Mobile Unit which allows them to listen to other users using their earpiece and to speak to other users using their microphone. The power for the Headset & Mobile Unit will be provided by a small belt mounted battery pack on which will be mounted the user controls e.g. the Press to Speak key. The battery pack is designed to allow the user to operate in the TWIRC area for at least 4 hours without changing the battery pack (assuming a fully charged battery).

The system consists a collection of Antenna mounted above head height in the designated area. The users Headset & Mobile Unit will communicate with the Antenna using Infra-Red signals in both directions. These Antenna are wired to a fixed Base Station which in turn is wired to the Ship's Communication system.

The infra-red communication to and from the Headset & Mobile Unit will use any Antenna on the system, therefore the user may be mobile in the area which is within the range of the system. For this reason the Headset & Mobile Unit is designed with the infra-red devices located on the top of the unit providing the best possible coverage.

Figure 1

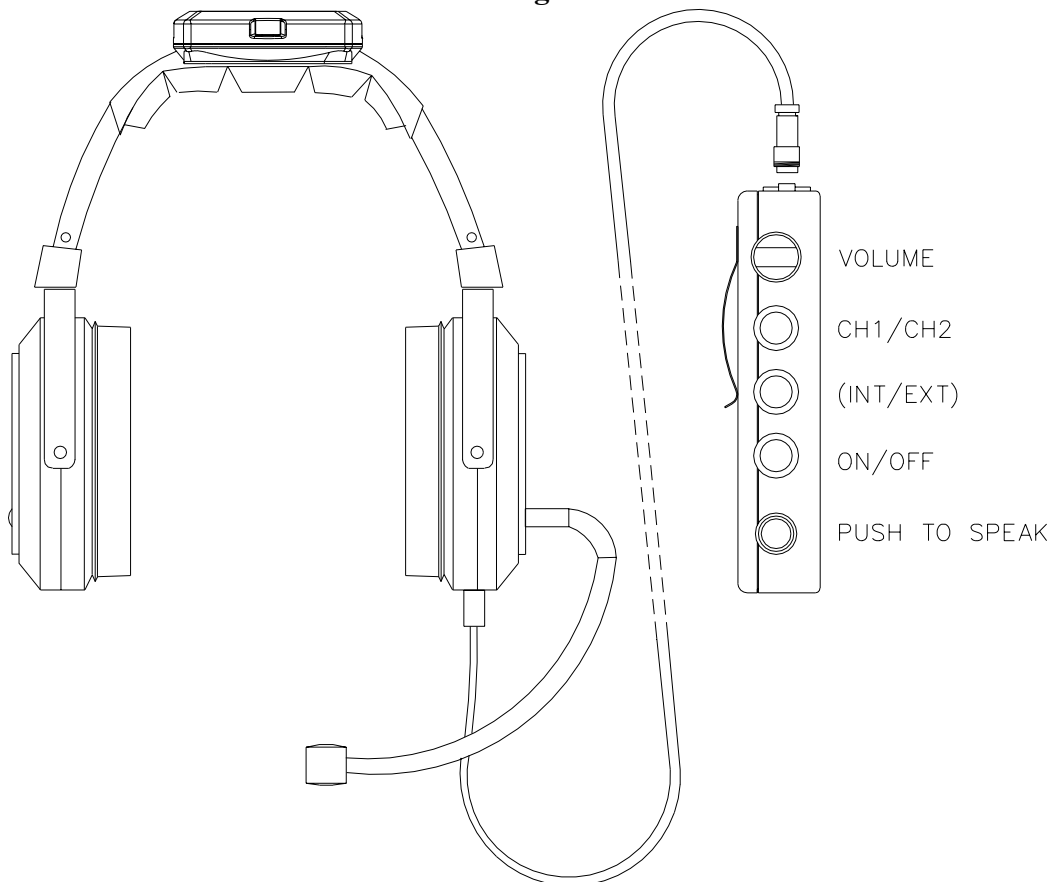


Figure 1 shows a typical “Man on the Move” equipment which consists of two units:

the **Headset & Mobile Unit** and the **Battery Pack**.

The TWIRC system is a digital communication system which allow the users access to up to 2 channels (Baseline System). The system is such that all users may hear the signal on the particular channel selected. In order to speak on one of the two channels the user must press the Press To Speak (PTS) key. Normal PTS discipline is necessary to ensure all users have access to the channels in order to speak.

When the system is being used to communicate with the Ship’s Communication System the TWIRC system is provided with a user’s sidetone signal such that the signal from the user speaking is feedback to the all user’s earpieces together with the incoming voice signal from the Ship’s Communication System

Two systems are available the Baseline System and the Enhanced System. The Baseline system allows the user to communicate with other users on the TWIRC system and on the Ship’s Internal Communication System. The Enhanced System has all the facilities of the Baseline System but has the additional feature of being able to communicate with the Ship’s External Communication System. The external communication places some operational requirements on the TWIRC system which are not necessary on the Baseline system. The differences will be detailed in the appropriate sections.

2. User Controls - Summary

Item	Description	Ref.
Headset & Mobile Unit	Noise Attenuating or Lightweight, includes Microphone and the Mobile Unit located on top of the Headset. Connected to the Battery Pack	3.1
Battery Pack	Rechargeable Battery and User Controls, Headset & Mobile unit plugs into the Battery Pack	3.2
Power ON/OFF	Located on Battery Pack, Switches Battery ON and OFF. When in the ON position the user may hear the communication channel selected.	3.2.2
Ch1/Ch2 select	Located on Battery Pack, Switches between Channel 1 and Channel 2	3.2.4
Internal/External Select (Enhanced only)	Located on Battery Pack, Selects between Internal Communications Circuit and External Communications Circuit	3.2.5
Volume control	Located on Battery Pack, Adjusts the Loudness in the Earpiece	3.2.6
PTS	Located on Battery Pack, Push to Speak switch, must be operated to speak on the TWIRC system	3.2.3
Battery Charger	Used to re-charge the Battery Packs	4

2.1 Information LED & Tones

The LED is located on the Battery Pack and the Tones will be heard in the user's earpiece.

Item	Description
Battery Pack LED	The LED being ON indicates the Battery Pack is switched ON.
Infra-Red Area Tone	A single beep every 4 seconds (only heard when no voice signal being received) Indicates that Infra-Red signals are being received
Battery Low Tone	A double beep every 2 seconds indicates that the Battery Pack needs re-charging
External Communication Circuit Selected (Enhanced System only)	A tone at a low level which is ON for approximately 1 second every 4 seconds. Indicates that both earpieces and the microphone are connected to the External Circuit

3. User Controls - Detail

3.1 Headset & Mobile Unit

The Headset unit is available in two models:

The noise attenuation model and The lightweight model

The Noise Attenuation model is for areas where the ambient noise is likely to be high and will therefore interfere with normal conversation unless the effect of the noise is reduced. A typical area for using this headset would be a machinery space.

The Light Weight model is for use in areas where the noise level is not high and where the received signal is only required in one ear. The other ear being available to hear local signals. A typical area for use of this headset would be the Bridge area.

The Microphone for both models of the Headset is located on a boom originating from one earpiece.

3.1.1 Noise Attenuation Headset

The Noise Attenuation Headset should be worn such that the mobile unit fitted to the headset band is located centrally on top of the head. The microphone boom extends from the earpiece.

For the noise attenuation to be effective the ear caps should be fitted closely over the ear.

3.1.2 Light Weight Headset

The Light Weight Headset should be worn such that the mobile unit fitted to the headset band is located centrally on top of the head. The microphone boom extends from the earpiece.

3.1.3 Microphone

The Microphone for both models of the Headset is located on a boom originating from one earpiece. The microphone should be located near the lips in order to transmit the best signal.

3.1.4 Mobile Unit

The Mobile Unit is pre-fitted to the Headset Unit and contains no parts that are accessible to the user. The location of the Mobile Unit for correct operation is described in section 3.1.1 and section 3.1.2.

3.2 Battery Pack

The Battery Pack is a belt mounted unit which is designed to be located on the right side for operation by the right hand. As well as the battery all of the Mobile Unit user controls are located on the Battery Pack and this is the unit which needs the majority of the user instructions.

3.2.1 Battery

The Battery Packs contain re-chargeable batteries designed to allow the user to operate in the TWIRC area for at least 4 hours without changing the battery pack (assuming a fully charged battery). When the battery needs re-charging this is indicated by the battery low signal in the earpiece or the LED not being ON when the ON/OFF Switch is in the ON position. The Battery Pack should be re-charged when one of these indications occurs or at any convenient but earlier operational time.

The battery low signal is described in section 2.1.

To remove the Battery Pack the Power ON/OFF switch should be switched OFF, the Headset & Mobile Unit plug unlocked and the plug removed. A fully charged replacement Battery Pack may then be connected by inserting the Headset & Mobile Unit plug into the socket, locking the plug and turning the switch to the ON position.

The discharged Battery Pack may then be recharged using the Battery Charger as described in section 4.

3.2.2 Power ON/OFF

The Man on the Move equipment may not be in use at all times. In order to conserve the charge in the battery, the Battery Pack is fitted with an ON/OFF switch which disconnects the battery when the unit is not being used. When the ON/OFF switch is in the ON position, and there is charge in the battery, the LED on the Battery Pack will be ON. When the switch is in the OFF position the LED will be off and the Man on the Move equipment will neither receive or transmit any signals on the TWIRC system.

3.2.3 PTS

A Press To Speak button is provided. The user must press the button when ever they wish to speak to another user via the TWIRC system. The PTS button does not effect the signal being received in the earpiece.

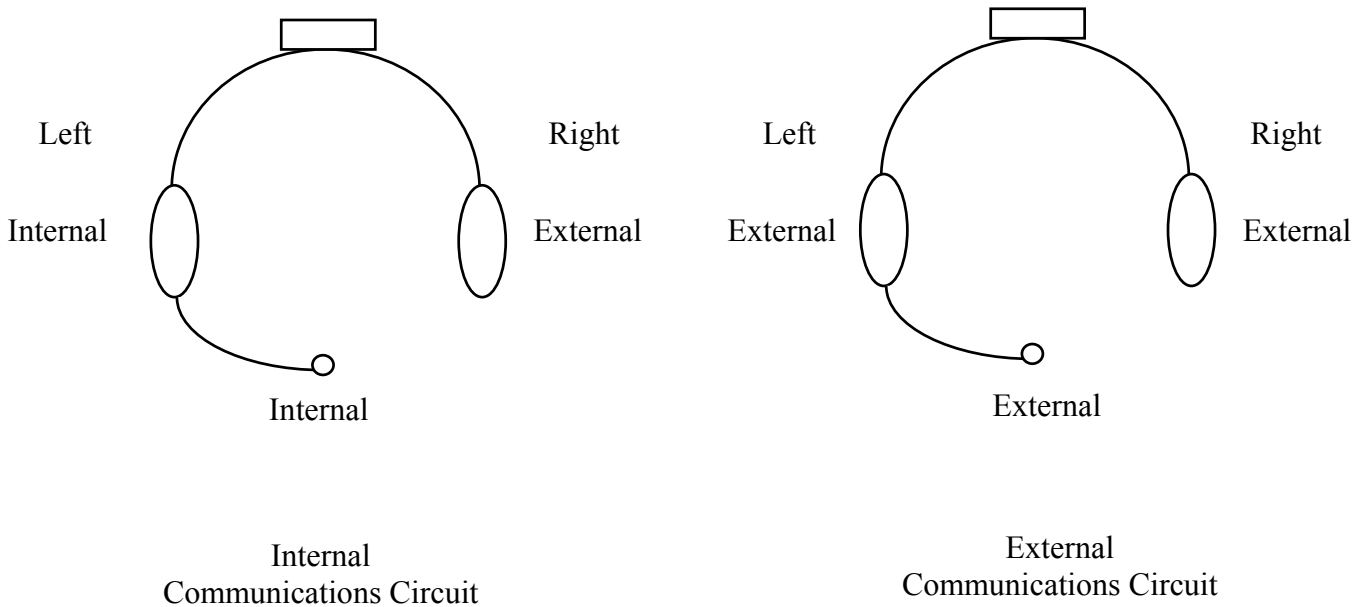
3.2.4 Ch1/Ch2 select

The TWIRC system may have two channels of communication. The Ch1/Ch2 switch allows the user to select which channel is being used to receive and transmit. Both the

transmit signal from the microphone and the receive signal to the earpiece will be connected to the same channel, either Channel 1 or Channel 2.

3.2.5 Internal/External Select (Enhanced System only)

The Enhanced TWIRC system has two circuits for communication, one for the ship's internal communications and one for the ship's external communications. When internal communications is selected the left ear will receive from the internal communication circuit and the right ear from the external communication circuit. The microphone will transmit on the internal circuit. When external communications is selected then both ears and the microphone will communicate on the external circuit. When external is selected the operator will hear a low level tone in both ears, this tone will be on for approximately 1 second every 4 seconds. The operator will still be able to hear the voice signal from the external circuit in both ears.



3.2.6 Volume control

A rotary volume control is provided to allow the loudness of the signal to the earpiece to be adjusted. The control is equipped with an indent system which has at least 8 settings. This prevents the user from accidentally changing the setting of the control.

3.3 Tones

3.3.1 Infra-Red Area Tone

When the user is in the Infra-Red area and there is no voice signal being received in the earpiece the user will hear a single beep every 4 seconds. This confirms that the infra-red reception is good.

3.3.2 Battery Low Tone

The battery in the Battery Pack is monitored, when the charge remaining is low (approximately 10 minutes left) a signal will be generated in the user's earpiece. This signal will be a double beep every 2 seconds.

3.3.3 External Communication Selected Tone (Enhanced System only)

If the user selects the External Circuit a tone at a low level will be sent to both earpieces. The tone will be ON for approximately 1s every 4 seconds.

4. Battery Charger

The Battery Charger is specifically designed for the TWIRC system using standard well proven technology.

The power to the Battery Charger will be provided from the local 115V ac supply. The Battery Charger is provided with a Power ON/OFF switch.

An LED is provided which indicates that the 115V ac supply is connected to the Charger and the Power Switch is ON.

The Battery Charger may be used to charge from 1 to 6 Battery Packs.

In order to maximise the life of the Battery Packs the charger will first discharge the Battery prior to charging it. The following section describes the operations necessary to re-charge the Battery Pack.

4.1 Normal Operation

The normal operation to recharge a Battery Pack is as follows:

- a) Ensure that the Battery Pack ON/OFF Switch is in the OFF position
- b) The Battery Pack LED should be OFF
- c) Locate the Battery Pack in one of the six positions and lock in position
- d) Insert the Battery Charger flying lead in to the Battery Pack Connector and Lock in position
- e) The Charge Status LED on the Battery Charger should be OFF
- f) The Battery Temperature LED should be OFF
- g) Should either e) or f) not be true then proceed to 4.2
- h) Turn the Battery Pack ON/OFF Switch to the ON position
- i) The LED on the top of the Battery Pack may turn on if there is charge left in the Battery
- j) Press the PTS Button to start the discharge and re-charge cycle
- k) The Charge Status LED will “Wink Off” (section 4.3) for up to 180 minutes while the Battery is being discharged
- l) When the discharge is complete the Charge Status LED will change to a steady ON state for up to 180 minutes until the Battery is fully charged. It will be unusual if the Battery Pack is not in this condition for at least 100 minutes. If the time is very short check for the other conditions identified in section 4.2.
- m) The Battery Charger will then change to Trickle Charging the Battery which will be indicated by the Charge Status LED changing to Flashing (section 4.3). This state will be maintained until the Battery Pack is removed from the Battery Charger

To remove the Battery Pack

- n) Turn the Battery Pack ON/OFF Switch to the OFF position

- o) The Battery Pack LED should be OFF
- p) The Charge Status LED should be OFF
- q) Unlock the Battery Pack connector and remove the flying lead.
- r) The Battery Pack may now be removed and is ready for use.

4.2 Other Conditions

The normal operations for using the Battery Pack and Battery Charger are described in section 4.1 This section describes other conditions that may occur when using the Battery Charger.

Possible Fault Symptom	Reference
Battery Status LED in “Wink-On” State	4.2.1 or 4.2.3
Temperature LED ON	4.2.2 or 4.2.3 or 4.2.4
Charge Cycle (Battery LED Steady ON) for a very short time	Ambient Temperature too high, Battery Temperature too high, battery faulty. Check other conditions in this table.

4.2.1 Battery Pack that has been left in a discharged state for a long period

If the battery in the Battery Pack has been left in the discharged state for a long period the voltage of the battery may have reached a voltage outside the range for normal charging. The Battery Charger will detect this condition and will trickle charge the battery until it is in an acceptable state for normal charging. When the battery is being trickle charged the Battery Status LED will “Wink On” (section 4.3).

4.2.2 Temperature of Battery Too High or Too Low

The Temperature LED will be ON when the temperature of the battery is outside an acceptable range.

4.2.3 Initial Temperature of Battery Too High or Too Low

When the re-charge cycle is started then if the temperature of the battery is outside an acceptable range the Temperature LED will be ON and the Battery Status LED will be “Wink On” (section 4.3). The battery will be trickle charged until the temperature is in an acceptable range and then the normal discharge/re-charge cycle will start.

4.2.4 The Battery Temperature becomes excessive during charging

If the temperature of the battery exceeds an acceptable range during the charging process, the charging process will be terminated. The excessive temperature will be indicated by the Temperature LED being ON. This is not a normal condition and may result in the Battery Pack not being fully charged.

4.3 Summary of LED Status Indication

4.3.1 Charge Status LED

Status	Normal Condition	LED Condition	System
OFF	Yes	Steady Off	Battery Pack switch in the OFF position, or the PTS button has not been pressed to start the charge cycle, or no Battery Pack connected
Wink Off	Yes	On most of the time with a short period off every 1.5 seconds	Battery being discharged
Wink ON	No	Off most of the time with a short period on every 1.5 seconds	Battery has not yet started the charge cycle, either the Temperature is out of range (see Temperature LED) or the battery has been excessively discharged. The battery is being trickle charge until both the Temperature and Battery voltage are ready for charging.
Flashing	Yes	LED Flashing every 0.25 seconds	The battery charging cycle is complete and the battery is now being trickle charged in order to maintain its capacity.
ON	Yes	Steady ON	The battery is being charged

4.3.2 Temperature LED

Status	Normal Condition	LED Condition	System
OFF	Yes	Steady Off	The temperature of the battery is in an acceptable range
ON	No	Steady ON	The temperature of the battery is outside an acceptable range

4.3.3 Battery Pack LED

Status	Normal Condition	LED Condition	System
OFF	Yes	Steady Off	The Battery Pack ON/OFF switch is in the OFF position
OFF	No	Steady Off	The Battery Pack ON/OFF switch is in the ON position and the battery is fully discharged
ON	Yes	Steady ON	The Battery Pack ON/OFF switch is in the ON position.