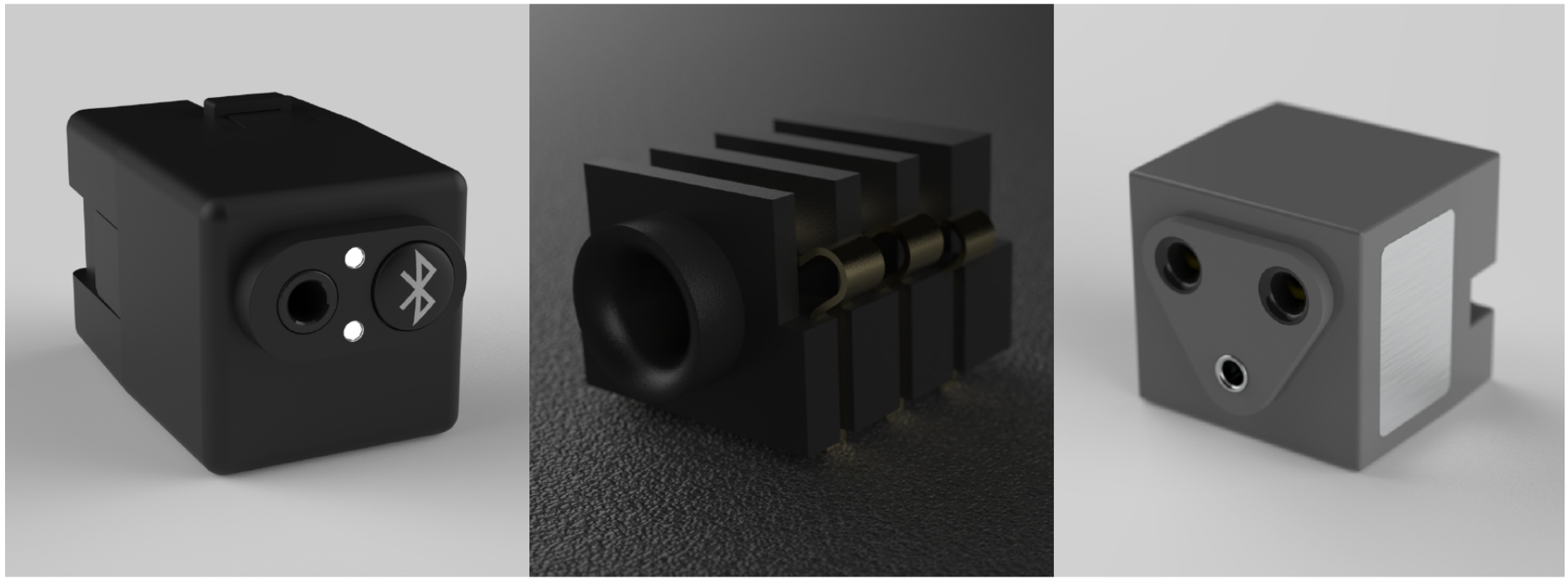
WHICH AUDIO JACK?

Making the right choice for your headset



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IFPL

IFPL IS AN INNOVATIVE AWARD WINNING COMPANY SPECIALISING IN THE DESIGN AND MANUFACTURE OF PASSENGER INTERFACE SOLUTIONS TO THE GLOBAL IN-FLIGHT ENTERTAINMENT AND CONNECTIVITY (IFEC) INDUSTRY. THIS GUIDE WILL FOCUS ON RELIABLE AND EFFICIENT IFPL AUDIO JACKS

IFPL has compiled this guide to enable you to understand what audio jacks are all about. It explains in simple terms the relationship between the jack, the headset and how it all interfaces with the passenger. Ultimately we are all aiming to provide our customers with the best and most reliable service that enhances their flight experience. Selection of a good quality audio system is of paramount importance.

The information should help you work out what priorities you have for your IFE system. For example, you may find the 'fit and forget' idea of a Long Life jack more desirable than the short changeover time of the Rapid Fit jack.

IFPL provides a variety of jacks that have special features suited to individual IFE systems. If we don't already make it, we can design from new or modify existing modules. For the technically minded, many more details are available on our website.

WWW.IFPL.COM

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USING THIS GUIDE

The guide explains what an audio jack is and how headsets work. It takes you through each type of audio jack and headset, explaining what each does and what systems you would use them for.

There is a summary of headset plugs and audio jack models with pictures to enable you to recognise the different types.

At the back you will find a handy chart which allows you to pick a headset and view which audio jack(s) are compatible.

The guide is intended to be simple and take some of the mystery out of audio jacks; it does not provide details of every variation available. Many bespoke designs are available upon request.

WHAT IS AN AUDIO JACK?

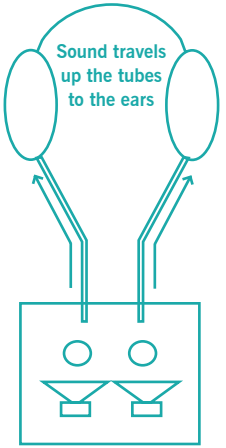
An audio jack is the 'socket' or 'jack' in the seat, into which you plug a headset. It is often configured in a small cube shaped module with a simple cable harness to connect into the seat box.

Sometimes the jack is built into the Passenger Control Unit (PCU) or even the seat-back video display.

HEADSET TYPES

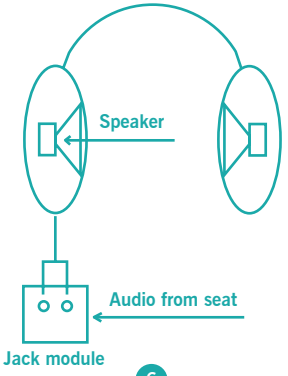
Pneumatic

Although most airlines now use electronic headsets, the original headsets were pneumatic. This meant that they carried audio to the earpieces via a 'stethoscope' tube. Audio was provided via a 'transducer' in the seat, which would contain miniature loudspeakers.



Electronic

(Non-Noise) Most people are familiar with regular electronic headsets. These are the types we use with our mobile phones or MP3 player. They carry audio to the headset electronically. The headset is normally fitted with either a single or two-pin plug

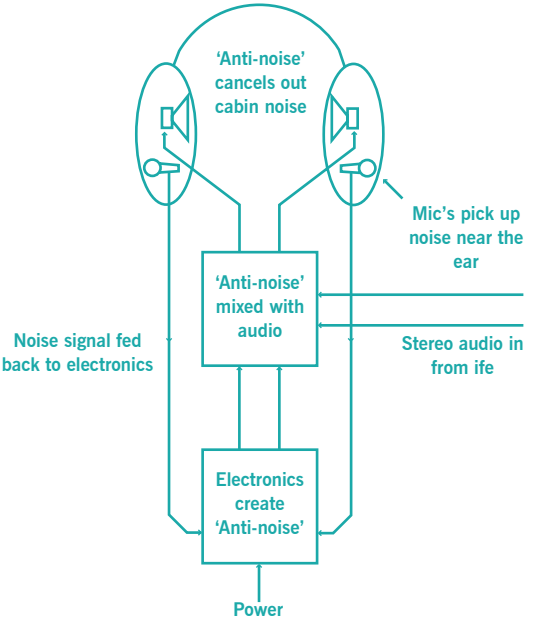


NOISE CANCELLING HEADSETS

Noise Cancelling Headsets are becoming increasingly popular within the Aerospace industry and within everyday life, and more airlines are choosing to use these headsets as a way to enhance the flight experience for their passengers.

Noise Cancelling Headsets work by picking up the noise inside the cabin. Electronic circuits then convert the noise signals into 'Anti-Noise' and feed this back into the headset to cancel out the cabin noise.

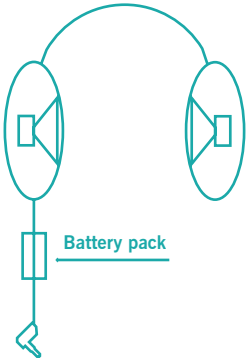
Due to the nature of noise in the cabin, no headset can fully cancel out all the noise being produced, resulting in the headsets having a slightly misleading name and should be more appropriately named Noise Reduction Headsets. The measure of a good Noise Cancelling Headset is the level of noise reduction it can achieve whilst still offering good user comfort.



NOISE CANCELLING HEADSET TYPES:

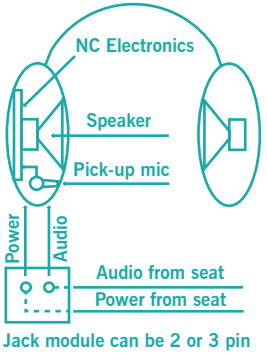
With Battery

This type of headset is powered by a battery and you can buy these headsets from a store and use as a personal carry on item. Normally, all of the electronics are inside the ear cups. Because of the need for batteries, very few airlines use these. The headsets usually have single pin plugs.



Powered Noise Cancelling Headsets

This type of headset is one of the more commonly used by airlines in premium cabins. The electronics are contained inside the ear cups, but instead of being battery powered, the headset draws its power from the seat box via the Power Jack Module. To achieve this, the headset has an extra pin to complete the power connection, meaning that these headsets usually have two or three pin plugs.

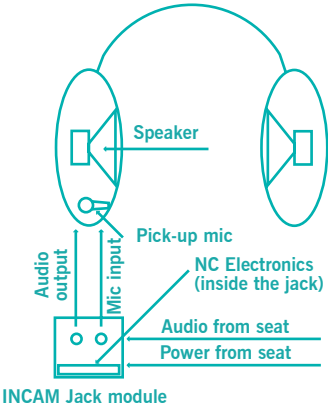


NOISE CANCELLING HEADSET TYPES:

Integrated Noise Cancelling Audio Module (INCAM)

Low Cost Noise Cancelling Headsets operate in the same way as most other Noise Cancelling headsets, except that the electronics in the headsets has been removed and incorporated in the INCAM and placed within the seat itself. This enables the use of low cost headsets.

The benefits of this type of headset are low cost and high reliability. Due to the headsets no longer needing the electronics inside them, but still needing the microphones in the ear cups, the unit cost can decrease significantly and because the electronics are now housed inside the Jack in the seat. It's a positive outcome for everyone and many airlines have been able to place noise cancelling headsets throughout the whole cabin.



HEADSET PLUG TYPES

Airline IFE headsets seem to come with a myriad of plugs on the end. In an effort to standardise the available types, the plug layouts are defined in the ARINC 628 pt2 standard and have been given a reference letter and number combination.

Detailed Information

Plugs for airline entertainment headsets are categorised into four different types, each with a variety of features. Each plug configuration is made up of a combination of 3.5mm and 2.5mm diameter connector pins.

Type A headsets have 300 ohms impedance per side and Type B headsets have just 40 ohms impedance. Type A and Type B headsets are used typically with airline entertainment systems without active noise cancellation electronics, and the plugs are either single or dual pin.

Type C headsets that incorporate active noise cancellation electronics within the headset use dual pin or triple pin plugs.

Type D (INCAM) headsets are similar to Type C headsets except that the active noise cancellation electronics are installed remotely within the Jack module. Type D headsets use dual pin plugs (Type D plugs are electronically different to Type C plugs), see page 12 + 13 for more information.

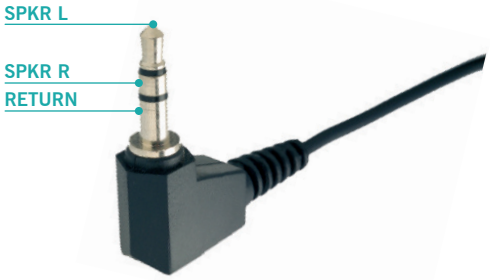
HEADSET PLUG TYPES

Headset Type	ARINC Designation	Impedance	Plug Type
Non-Noise Cancelling	A1	300	Single Pin, 3.5mm,Right Angle
	A2	300	Dual Pin, 3.5mm,Right Angle
	B1	40	Single Pin, 3.5mm,Right Angle
	B2	40	Dual Pin, 3.5mm, Right Angle
Powered Noise Cancelling	C1	300	Dual Pin, Right Angle, (2.5mm + 3.5mm)
	C2	300	Triple Pin, Right Angle, (2.5mm + 2 x 3.5mm)
Compatible with INCAM	D1	40-300	Dual Pin, Right Angle, (2.5mm + 3.5mm)
	D2	40-300	Dual Pin, Right Angle, (2 x 3.5mm)

HEADSET PLUG TYPES

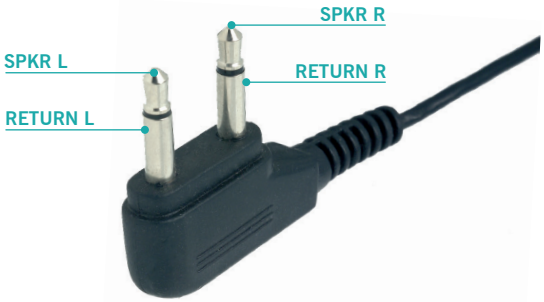
Single Pin - ARINC A1

Used with regular Noise-Cancelling Headsets



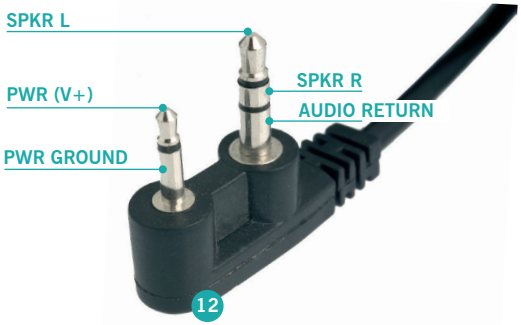
Dual Pin - ARINC A2

Used with regular Non-Noise Cancelling Headsets. This type of plug is often referred to as 'dual mono' because it uses two mono plugs. It is still actually a stereo plug.



Dual Pin - ARINC C1

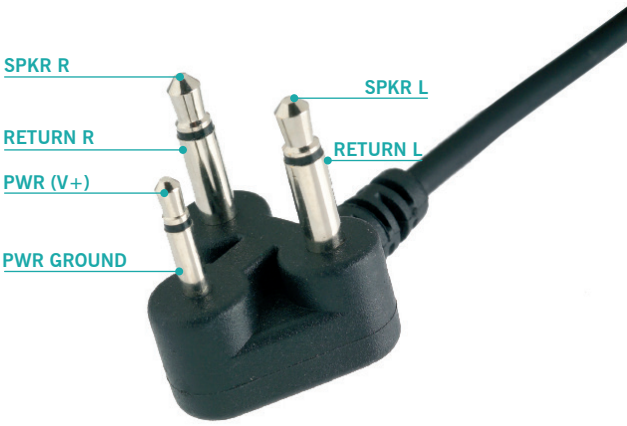
Used with powered Noise Cancelling Headsets. The 2.5mm plug supplies 12 volts to the noise cancelling electronics inside the headset. The 3.5mm plug supplies the audio (stereo).



HEADSET PLUG TYPES

Three Pin - ARINC C2

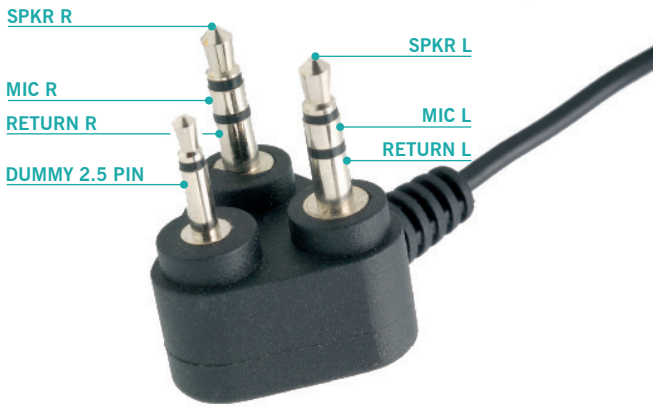
Used with powered Noise Cancelling Headsets. The 2.5mm plug supplies 12 volts to the noise cancelling electronics inside the headset. The 3.5mm plugs supply the audio (Left + Right).



Triple Pin - Modified ARINC C2 (D3*)

Used with INCAM Low Cost Noise Cancelling Headsets.

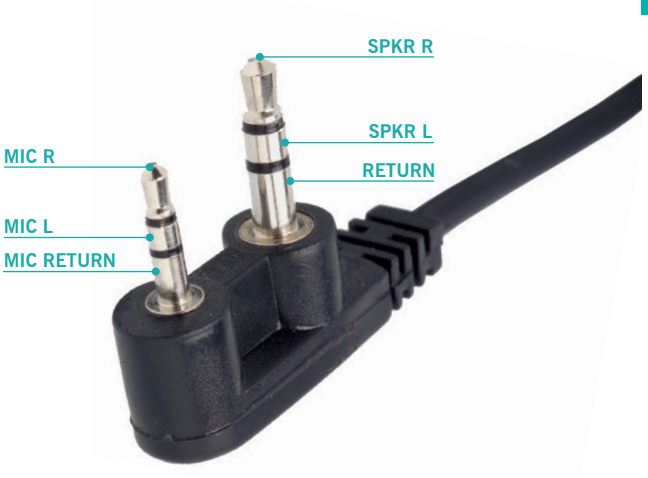
** This plug is a variation of the D2 Type with an added 2.5mm dummy pin for extra strength. Note that there is no ARINC standard for this type of Jack and as such is termed 'modified ARINC C2' or 'D3'.*



HEADSET PLUG TYPES

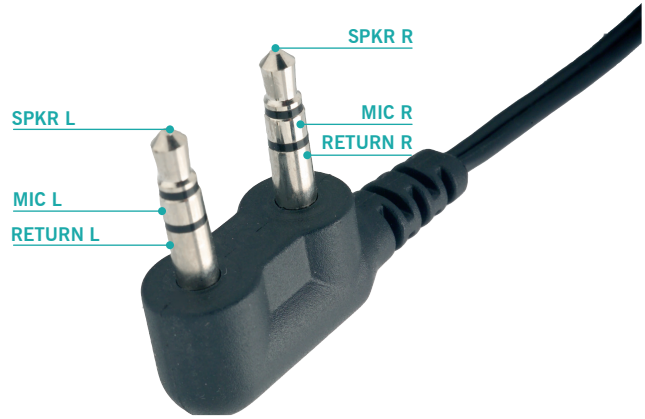
Dual Pin - ARINC D1

Used with INCAM low cost Noise Cancelling Headsets. There are two types of 'D1' plugs and designations are under review by the industry standards committees. To provide backwards compatibility with single pin A1 headsets, there is a D1 Plug available that is 'reverse wired' i.e. tip = Left. This version is commonly known as D2 with the 'standard' (as shown) known as D1-1.



Dual Pin - ARINC D2

Used with INCAM Low Cost Noise Cancelling Headsets.



AUDIO JACK TYPES

There are several IFE suppliers who make audio jacks. The following are made by IFPL. They have been developed with special features. A range of options can be incorporated into one audio jack, such as backlighting and extra safety features.

Long Life

IFPL has developed two very different Jack concepts to meet the varying needs and priorities of different airlines: ***'Reliability & Maintainability'***

Our Long Life Jack has been tested beyond 100,000 cycles, which is far greater than anything else that is available on the market. The Long Life Jack is effectively 'Fit & Forget'.

Long Life Jacks from IFPL use extremely high quality terminals housed within a robust glass reinforced plastic body to give maximum reliability. An open back on the Jack provides a 'Push-Through' feature to reduce the chances of blockage due to debris or broken plug tips.

INCAM - Integrated Noise Cancelling Audio Module

INCAM has taken the complex electronics out of the headset and placed them in the Jack module. This greatly reduces the cost of the headset and increases the reliability and maintainability of the audio system. Airlines are finding this a cost-effective way of providing noise cancelling audio throughout the aircraft.

The INCAM Jack is used with the Low Cost Noise Cancelling Headset. INCAM is available in both Long Life and Rapid Fit.

AUDIO JACK TYPES

Rapid Fit

The Rapid Fit jacks improve the maintainability of the IFE system. However tough and robust we make our Jacks, they will always be vulnerable. Knowing this, IFPL invented the Rapid Fit Jack.

The Jack part is housed in a low cost removable cassette that can be replaced quickly and easily without taking the main unit out of the seat. The cassette can be replaced in approximately 30 seconds. That results in savings on maintenance costs.

Mag Signal

IFPL's MagSignal technology allows the headset cable to be pulled from any angle without damaging the socket, jack or headset cable. This extends the life of the headset and jack, reducing Customer Induced Damage (CID). The floating magnets ensure the signal is maintained at all times during turbulence and vibration.

The MagSignal Breakaway incorporates IFPL's Long Life jack technology, tested to over 100,000 insertions.

Key features:

- **Reduced headset breakage**
- **Save money**
- **Accepts regular headset plugs**

Dual Purpose

Accepts single pin and dual pin headset plugs. Available in Rapid Fit or Long Life formats.

The 1248 is a variant of the Rapid Fit family and the 1129 is a variant of the Long Life family. Both permit the use of ARINC A2 & A1 headsets. Either socket will accept the A1 headset and provide stereo audio output.

AUDIO JACK TYPES

Self-Testing

With short turnaround time, aircraft maintenance personnel have to work quickly and efficiently. No airline wants to find that a passenger cannot access audio on their IFE system, so broken Audio Jacks have to be identified and fixed. Therefore we have launched the Self-Testing Jack.

Key Features:

- **Indicator gives quick and easy system check**
- **Every Jack can be checked with just a glance**
- **Saves money on maintenance costs**

Push Through Pin

The IFPL 'Push Through Pin' technology is designed to allow broken or damaged pins to be ejected should the broken or damaged pin become lodged into the socket through CID.

In the unlikely event the unit requires replacement, the models are also designed for simple on-wing replacement.

AUDIO JACK SUMMARY

The Long Life Range (100,000 insertions)

1010 Single Pin

1286 Single Pin (Miniature)

1129 Dual Pin (Dual Purpose)

1159 Triple Pin Powered NC

AUDIO JACK SUMMARY

The Long Life Range (100,000 insertions)

1129 Long Life Dual Pin INCAM

1155 Long Life Triple Pin INCAM

1241 Self-Testing Jack

AUDIO JACK SUMMARY

The Rapid Fit Range (30 Second Time To Repair)

1052 Single Pin

1056 Dual Pin

1064 Dual Pin Power Jack Model Powered NC Headsets

1067-400 Rapid Fit INCAM

AUDIO JACK SUMMARY

The Rapid Fit Range (30 Second Time To Repair)

1067-300 Rapid Fit INCAM (Low Cost NC)

1067-600 Rapid Fit INCAM (Low Cost NC - Reverse Wired)

1248 Dual Pin (Dual Purpose)

1244 Audio and Power

AUDIO JACK SUMMARY

The Breakaway Range

1327 Double Pin

1272 Triple Pin

2045 Bluetooth Audio

Detailed datasheets are avilable on our website or contact Innovate@ifpl.com

GLOSSARY

ARINC (628)	Avionics specification used for headsets
AUDIO JACKS	Sometimes referred to as 'jacks', 'sockets', RJU and RJM.
CASSETTE	Removable part of the Rapid Fit Jack which can be changed whilst leaving the module in the seat.
CONNECTOR	Generic term for the male and female parts of jack and plug.
INCAM	Integrated Noise Cancelling Module. IFPL's low cost Noise Cancelling solution.
JACK	Female or receptacle part of connectors, also called socket.
NC	Noise Cancelling.
MIC	Abbreviation of microphone
NCH	Noise Cancelling Headset.
NC	Noise Cancelling
PIN	Male part of connectors, also called plug or connector. Audio Jacks are frequently referred to as being one, two or three pin/plug types. This refers to how many holes it has to receive pins from the headset.
PCU	Passenger Control Unit.
PLUG	Male part of connectors, also called pin. Headsets are often referred to as having a 'two pin plug'.
POWER JACKS	A jack with an extra pin to provide power to headsets that have built in NC electronics.
RJU/RJM	Remote Jack Unit/Module.
USB	Universal Serial Bus.
IFE	Inflight Entertainment

NOTES

NOTES

COMPATIBILITY CHART

INCAM LOW COST NC HEADSETS
POWERED NC HEADSETS
BREAKAWAY

JACKS

1010 1286 1129 1159 1241 1272 1155 1327 1152 2045 1052 1056 1248 1064 1067-400 1067-300 1067-600 1244

HEADSETS

Single A1

Dual A2

Dual C1

Triple C2

Dual D1

Dual D2

Triple C2 Modified

Breakaway
1298 Breakaway Triple C2
USB

Magsignal Dual1330

Bluetooth Headset

LONG LIFE

RAPID FIT