

# Application Note

## 2.5 BOOM MICROPHONE ASSEMBLIES

For optimal signal to noise performance, it is always preferred to put the microphone as close as possible to the sound source. In a free-air environment signal level drops by 6Db for each doubling of distance between the sound source and microphone. Headset booms allow the microphone to be placed in the near field, where a noise canceling microphone responds the difference in acoustic pressure. The combination of a good close-talking microphone element and close proximity to the mouth provides excellent signal to noise even in extremely noisy conditions.

### 2.5.1 FIXED BOOMS

#### Construction

PNR, PWP, and PBJ Series boom microphones are made with 4mm O.D. nylon tube that is heat-formed to set a bend angle. The microphone housing is also nylon, and includes sintered metal sound port covers that are treated to be “splash-proof”.

Boom Series	Contains Element Series	Description
PNR	NR	Noise Canceling Elettret
PWP	WP	Waterproof Noise Canceling Electret
PBJ	BJ	Noise Canceling Balance Armature

All use enamel coated copper wire, and include a foam windscreen. An end cap is provided to facilitate customer assembly of an exit cable.

For PNR and PWP Series, both 3-wire and 2-wire versions are available. Some NR and WP elements include inbuilt RFI filter capacitors that are effective at GSM and CDMA frequencies.



**PNR / PWP Boom Tube and Housing**



**PBJ Tube and Housing**

# Application Note

## Applications

All of these fixed shape plastic boom microphones are lightweight and low-profile. Typical applications:

- Lightweight noise-canceling headset for telephony, computer speech recognition, or other indoor use.
  - Excellent noise canceling allows intelligibility with “open office” floor plans.
  - Intended for swivel mounting to allow accurate positioning needed for noise canceling microphones.
- Helmet or face mask integration
  - The low profile shape of PNR, PWP, or PBJ fits into the small area in front of the mouth inside a helmet.
  - Using a small exit hole, these fixed booms may be installed in a mask that covers the nose and mouth (for firefighters, court stenographers, etc.)

Note: The microphone housings for NR, WP are available for separate purchase for customer assembly. Tubeless EK and EA models also fit. The microphone housings have a circular stem that can insert in a larger housing or PCB assembly.



**VR-105 Housing Parts**



**VR-105 Parts Assembled**

## 2.5.2 FLEXIBLE BOOMS

FB Series flex booms retain their position when bent. When the end of the boom is clamped, the free end can be positioned in front of, or away from the mouth as needed. Models are available with a variety of boom types, depending on strength and weight requirements:

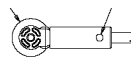
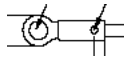
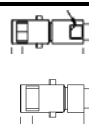
# Application Note

Boom Description	Letter Assignment
2.3mm OD Inner Wire	<b>A</b>
2.7mm OD gooseneck (w/ shrink tube)	<b>B</b>
4.2mm OD gooseneck (w/shrink tube)	<b>D</b>
5.4mm OD gooseneck (w/shrink tube)	<b>E</b>
5.9mm OD gooseneck (w/shrink tube)	<b>F</b>

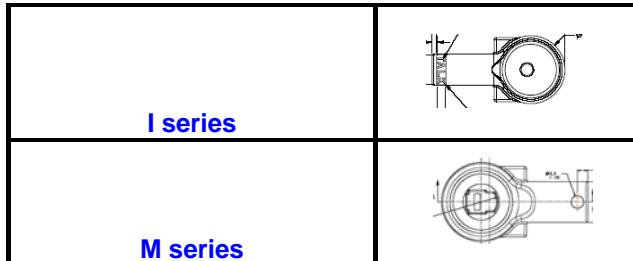


**Example: 5.9mm Gooseneck Material**

A variety of housing types are also available:

Letter Assignment	Housing Image
<b>E Series</b>	
<b>W series</b>	
<b>O series</b>	

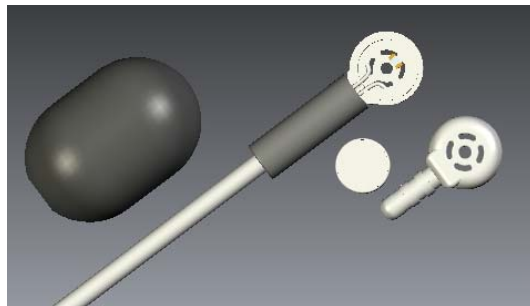
# Application Note



FB booms are grouped into series by housing type. The complete model number takes the format of FB-XX-YYYYY-ZZZ. The XX portion describes the boom type and microphone housing design; first X is boom type, second X, housing type (series). The YYYYY portion is the 5 digit model number, and ZZZ is the suffix. Each combination of YYYYY-ZZZ is unique.

For example FB-DW-30294-000 has a 4.2mm boom and W type housing.

## “E Series”



E Series booms have a model number in the format FB-XE-YYYYY-ZZZ. ECM elements are used in E Series booms. Omni-directional, noise canceling, and uni-directional models are available, and 2.3mm, 2.7mm, 4.2mm boom sizes. Recommended models at the time of this writing:

Model #	Element	Boom Length	Exit Wire Length	Boom Dia	Electrical
FB-AE-30389-000	MB6022NSC-0C Noise canceling	127mm wire type	60mm	2.3mm	2-wire mode
FB-AE-30209-000	MB6022ASC-1 Omni-directional	127mm wire type	60mm	2.3mm	2-wire mode
FB-DE-30290-000	MB6022NSC-0C Noise canceling	140mm gooseneck	60mm	4.2mm	2-wire mode

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# Application Note

FB-DE-30291-000	MB6022ASC-1 Omni-directional	140mm gooseneck	60mm	4.2mm	2-wire mode
FB-DE-30292-000	MB6022USC-3 Uni-directional	140mm gooseneck	60mm	4.2mm	2-wire mode

## Construction

Nylon microphone housing -- slotted sound port(s), positionable boom, flying leads, windscreen.

## Applications

- Designed for customers who are looking for small footprint and lightweight
- Security, Police, Fire, dispatcher, other lightweight comms

## “W Series”



W Series booms have a model number in the format FB-XW-YYYYY-ZZZ. NR and WP (waterproof) elements are used in W Series booms. Omni-directional and noise canceling models are available, and 2.3mm, 2.7mm or 4.2mm boom sizes. Recommended models at the time of this writing:

Model #	Element	Boom Length	Exit Wire Length	Boom Dia	Electrical
FB-DW-30294-000 Rated 3m	WP-25993-D63 (Waterproof)	140mm	60mm	4.2mm	2-wire mode
FB-BW-30335-000 Rated 3m	WP-25993-D63 (Waterproof)	160mm	60mm	2.7mm	2-wire mode
FB-DW-30296-000 Rated 3m	WP-25993-000 (Waterproof)	140mm	60mm	4.2mm	3-wire mode
FB-DW-30293-000 Rated 1m	NR-25994-D63 (Noise Cancelling)	140mm	60mm	4.2mm	2-wire mode

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FB-BW-30330-000 Rated 1m	NR-25994-D63 (Noise Cancelling)	160mm)	60mm	2.7mm	2-wire mode
FB-DW-30295-000 Rated 1m	NR-25994-000 (Noise Cancelling)	140mm	60mm	4.2mm	3-wire mode

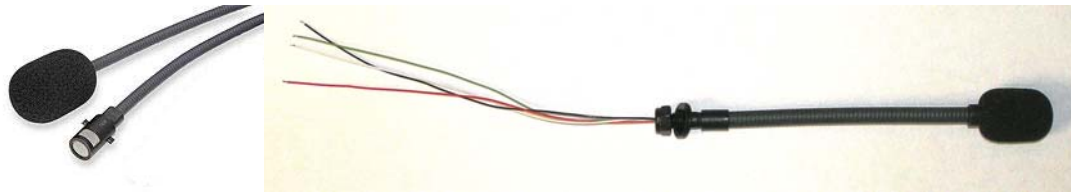
## Construction

Nylon microphone housing – splash-proof sintered metal discs, positionable boom, flying leads, windscreen.

## Applications

- Designed for customers who are looking for small footprint and lightweight
- Security, Police, Fire, dispatcher, other lightweight comms

## “O Series”



O Series booms have a model number in the format FB-XO-YYYYYY-ZZZ. NR, WP (waterproof), and EK elements are used in O Series booms. Omni-directional and noise canceling models are available, and 4.2mm or 5.9mm boom sizes. Recommended models at the time of this writing:

Model #	Element	Boom Length	Exit Wire Length	Boom Dia	Electrical
FB-FO-23511-000 Rated 3m	WP-23501-000 (Waterproof)	142mm	150mm	4.2mm	2-wire mode
FB-DO-25946-000 Rated 3m	WP-23501-000 (Waterproof)	54mm	30mm	4.2mm	2-wire mode
FB-FO-25624-000 Rated 3m	WP-23500-000 (Waterproof)	142mm	160mm	5.0mm	2-wire mode

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FB-DO-25581-000	EK-23024-000 (Omni)	104mm	140mm	5.9mm	2-wire mode
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## Construction

The standard housing is a brass cylinder plated matte black with monel screen in the sound port cutouts. The entire housing and gooseneck are isolated from the microphone element, and serve as a continuous EMI shield over the microphone and leads. A green shield wire is brought out with the microphone leads, and is available for chassis ground.



**4mm FB Boom**



**6mm FB Boom**



**4mm FB Boom End showing leads**



**M6 Threaded End Connector w/nut & washers**

Flying leads are used for the electrical connections. 6mm models use 28 gage Teflon jacketed hookup wire, and can be fitted with an end connector: M6 threaded with washers and lock nut. 4mm models use enamel insulated solid wire.

Windscreens are included, and windscreens treated for moisture resistance are available.



# Application Note

## Applications

O Series boom microphones are primarily intended for rugged circumaural (earcup style) headsets or helmets. Flying lead models terminate into an earcup swivel; models with end connectors may be fastened to a bulkhead. Typical headset applications:

- Radio Communication
  - Emergency Services
  - Military
  - Aviation
  - Motorcycle Helmet
  - Snowmobile Helmet

## “I Series”



I Series booms have a model number in the format FB-XI-YYYYY-ZZZ. BJ elements are used in I Series booms. Omni-directional and noise canceling models are available, 5.4mm gooseneck boom size. Recommended models at the time of this writing:

Model #	Element	Boom Length	Exit Wire Length	Boom Dia	Electrical
FB-EI-30026-000 Rated 1m	BJ-28471-000 (35Ω Impedance)	172mm	60mm	5.4mm	2-wire
FB-EI-30426-000 Rated 1m	BJ-28486-000 (150Ω Impedance)	172mm	60mm	5.4mm	2-wire

## Construction



# Application Note

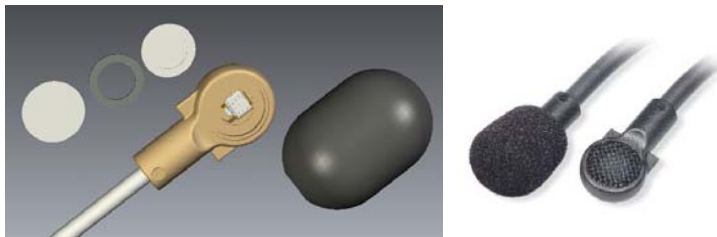
Nylon microphone housing – optional waterproof disc(s), protective metal screen(s), positionable gooseneck boom, flying leads, windscreen. Waterproofing ratings of 1m, 3m, and 10m are possible. Noise canceling and omni-directional versions are available. Windscreens available with optional moisture repellent treatment.

Microphone generates its own signal. Customized impedance is possible.

## Applications

- Radio Communications
  - Robust design for demanding high-reliability applications
  - Military, Special Operational Forces, Security, Police

## “M Series”



M Series booms have a model number in the format FB-XM-YYYYY-ZZZ. NR, WP (waterproof), or EK elements are used in I Series booms. Omni-directional and noise canceling models are available, and 4.2mm, 5.4mm or 5.9mm gooseneck boom sizes. Recommended models at the time of this writing:

Model #	Element	Boom Length	Exit Wire Length	Boom Dia	Electrical
FB-EM-30342-000 Rated 1m	NR-25994-D63 (Noise Cancelling)	167mm	60mm	5.4mm	2-wire mode
FB-EM-30343-000 Rated 3m	WP-25993-D63 (Waterproof)	167mm	60mm	5.4mm	2-wire mode
FB-EM-30344-000 Rated 10m	NR-25994-D63 (Noise Cancelling)	167mm	60mm	5.4mm	2-wire mode
FB-EM-30345-000 Rated 20m	NR-25994-D63 (Noise Cancelling)	167mm	60mm	5.4mm	2-wire mode
FB-EM-30346-000 Rated 1m	EK-23132-C36 (Omni)	167mm	60mm	5.4mm	2-wire mode

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FB-EM-30347-000 Rated 3m	EK-23132-C36 (Omni)	167mm	60mm	5.4mm	2-wire mode
FB-EM-30348-000 Rated 10m	EK-23132-C36 (Omni)	167mm	60mm	5.4mm	2-wire mode
FB-EM-30349-000 Rated 20m	EK-23132-C36 (Omni)	167mm	60mm	5.4mm	2-wire mode

## Construction

Nylon microphone housing – optional waterproof disc(s), protective metal screen(s), positionable gooseneck boom, flying leads, windscreen. Waterproofing ratings of 1m, 3m, 10m, and 20m are possible. Windscreens available with optional moisture repellent treatment. Noise canceling and omni-directional versions are available.

## Applications

- Radio Communications
  - Robust design for demanding high-reliability applications
  - Military, Special Operational Forces, Security, Police