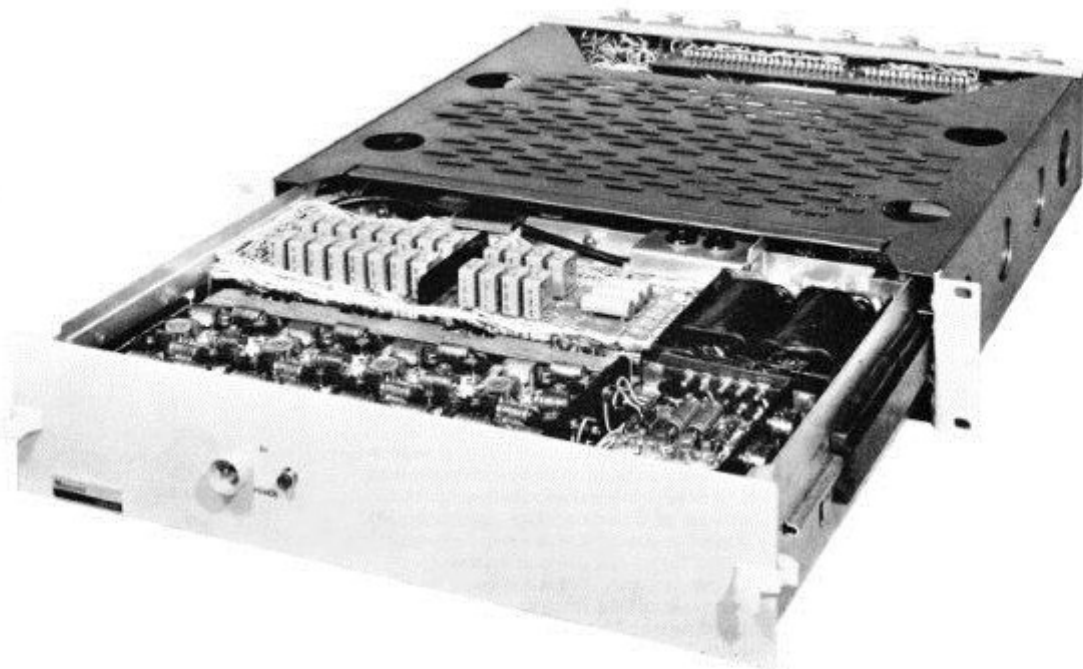




Marconi Broadcasting Studio Systems

Communications Equipment

B3656 Series



Features

Balanced, High Quality System

Adaptable to individual customer requirements

All solid-state

Limiting Amplifiers

Drawer Construction for easy access

Up to 13 inputs

On-air cues

Outside Broadcast or Studio application

Introduction

Good communications are essential for the efficient operation of a television studio or Outside Broadcast unit. Complex productions call for sophisticated systems and high quality speech reproduction.

The Marconi Communication System B3656 is designed to provide reliable and versatile talkback facilities which enable all key personnel involved in a production to communicate with one another. A particular feature is the way the system can be adapted to suit individual customer requirements.

General

The Communication System Type B3656 comprises a range of units which, in conjunction with the Marconi Colour Cameras, provide all necessary intercommunication facilities between production, operational and supervisory staff in a television studio or O.B. van during the production of a programme.

It consists of (a) the Communication Unit B00-3657, which provides TB switching facilities via a relay matrix, and distribution amplifiers for Production TB, Programme Audio, Mixed Camera TB (MCTB) and Mixed CCU TB (MCCUTB), and (b) a number of Control Panels. These provide

terminal facilities for the various users of the system, other than cameramen and vision (CCU) operators. The basic Talkback Control Panel B01-3658 is used at positions on consoles in control rooms, and Wall Outlet Boxes are used in studios, etc. A Loudspeaker Amplifier Panel B01-3659 is available for use with the Talkback Control Panel when separate microphone and loudspeaker working is preferred to the use of headsets.

A basic communication system using one Communication Unit, could have up to 7 control positions (Producer, Technical Manager, Vision Controller, Sound Engineer, Lighting Engineer, Boom Operator, Lighting Gallery). Five of these would be provided with Talkback Control Panels and, if required, Loudspeaker Amplifier Panels, and a further two (Boom and Lighting) with Control Boxes. By adding cross-point relays and diodes, provision is made on the Communication Unit to increase the number of control positions to up to 13. If, in a large scheme, more than 13 control positions are required, then one or more further Communication Units must be provided.

Communication Unit B3657

The Communication Unit B3657 is built into a 483mm (19in) rack-mounting horizontal drawer which occupies 89mm (3.5in) of rack height. Flexible cable forms allow the drawer to be pulled out with power on, and tilted either up or down for adjustment or servicing. External connections are taken to 26-way and 14-way sockets, as shown in Fig.4. Mounted on the movable part of the drawer are the Power Supply Unit; two double-sided PC boards which form the Talkback Matrix; one Auxiliary Board and four Distribution Amplifiers (each DA being a plug-in PC board). These DAs are used for distribution of Production Talkback, Programme Audio, mixed Camera Talkback and mixed CCU Talkback. They have a high input impedance and low output impedance.

The talkback matrix uses small diaphragm relays as crosspoint elements which can accept up to 13 inputs (one from each of the permissible maximum number of control panels). There are outputs for up to 13 control panels, up to 6 cameras (including CCUs) and to the TB bus, i.e. to the input of the Production TB DA. Initially, crosspoints are equipped to give the following facilities, which are operated by keys on the control panels.

- PRODUCER to Production TB bus at all times, and can also speak on Engineering TB to Vision Controller, Sound Engineer, Lighting Engineer and Studio Floor.
- TECHNICAL MANAGER can speak to individual cameras, Production TB bus, Vision Controller, Sound Engineer and Lighting Engineer.
- VISION CONTROLLER can speak to individual cameras, Producer, Production TB bus, Technical Manager and Lighting Engineer.
- SOUND ENGINEER can speak to Producer, Production TB bus, Technical Manager, Boom Operator and Studio Floor.
- LIGHTING ENGINEER can speak to Producer, Lighting Gallery and Studio Floor.
- BOOM OPERATOR can speak to Sound Engineer.
- LIGHTING GALLERY can speak to Lighting Engineer.

NOTE: All Control Panels (except Producer) receive Production TB, MCTB, MCCUTB and Programme Audio at all times independently of Key selection: Producer receives Remote TB, instead of Production TB and CAM Reverse talkback instead of MCTB.

The talkback matrix also mounts relays which are used for control of talkback circuits for cameras and CCUs. A switch on the Camera Control Panel of the CCU of the Marconi Colour Camera allows for 3 modes of operation:

- CAMERA.** This is the normal condition with CCU and its own camera connected together. Feeds also go to MCTB and MCCUTB DAs, for general use if required.
- CONFERENCE.** All CCUs and cameras joined together: CCU talks to all cameras via MCTB, so one CCU operator can talk to all cameras from one CCU position.
- ISOLATE.** CCU and its own camera connected together, but isolated from rest of the system although continuing to hear PROD TB.

When extra control panels are used, the appropriate crosspoint relays and diodes

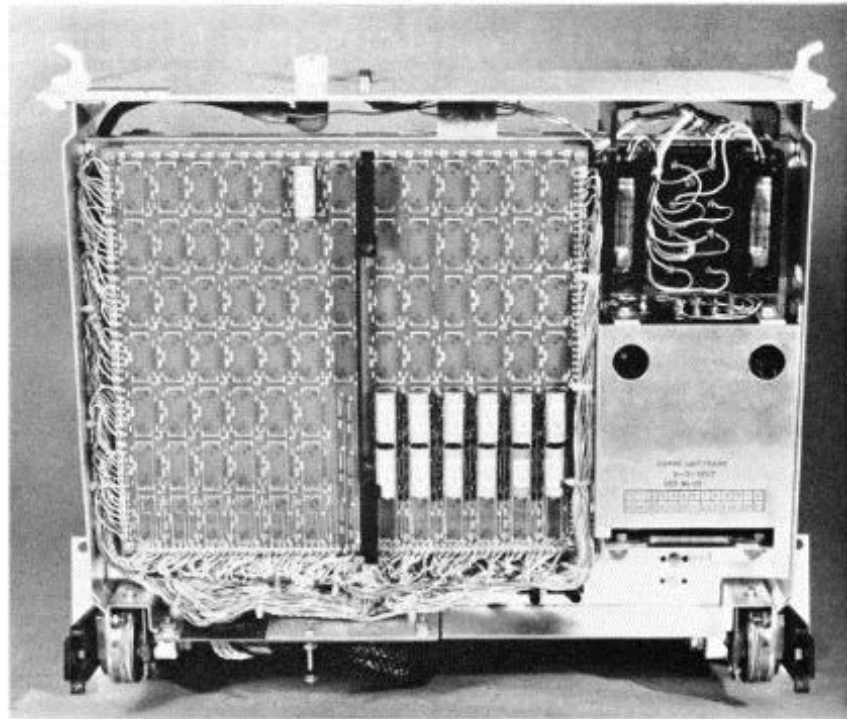


Fig.1 Communication unit B3657 tilted up showing underside

must be fitted to the TB Matrix. Note that only 10 of the 20 possible outputs (13 control panels, 6 cameras and Production TB bus) can be used, as there are only 10 selector keys on a control panel. If required, one key can be used to operate more than one relay; for example, one key could operate all 6 camera relays simultaneously, if omni-camera TB was a requirement.

The Power Supply Unit on the Communication Unit is adequate for most schemes, but if a large number of Loudspeaker Amplifier Panels are used an extra 24V PSU such as the Marconi B4203 would be required.

All audio circuits in the Communication Unit are balanced and floating. The feeds of the Production TB bus are resistively isolated to give protection in case of external faults on the system. A special 26-core cable B03-3002 is used for interconnections between Communication Unit, Talkback Control Panels and CCUs in which certain conductors have been selected as balanced pairs to minimize crosstalk.

Talkback Control Panel B3658

The Talkback Control Panel B01-3658 is designed for desk mounting, and is used as a terminal equipment by all personnel sitting at those positions, e.g. the Producer, Technical Manager, Sound Engineer, etc. It is fitted with a microphone on a 254mm (10in) flexible stalk (other lengths can be provided). A binary action illuminated push-button switch for microphone muting is provided. The 10 selector keys may be connected and labeled in a variety of combinations according to system requirements.

For normal use a Loudspeaker Amplifier

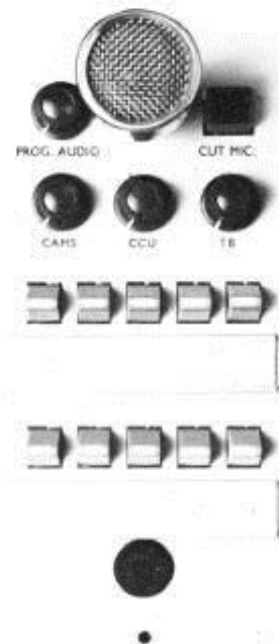


Fig.2 Talkback control panel B3658. The microphone (top centre of panel) is on a 10 inch flexible stalk

Panel B3659 is connected to the Talkback Control Panel. This is fed by the combined output of the headphone amplifiers. When a headset is plugged into the Talkback Control Panel the feed to the loudspeaker amplifier is disconnected. When any of the 10 selector keys are operated the feed to the loudspeaker amplifier is 'dimmed' by 12dB.

The inputs to the Talkback Control Panel are:

- From stalk microphone or headset microphone to the input of the mic amplifier.

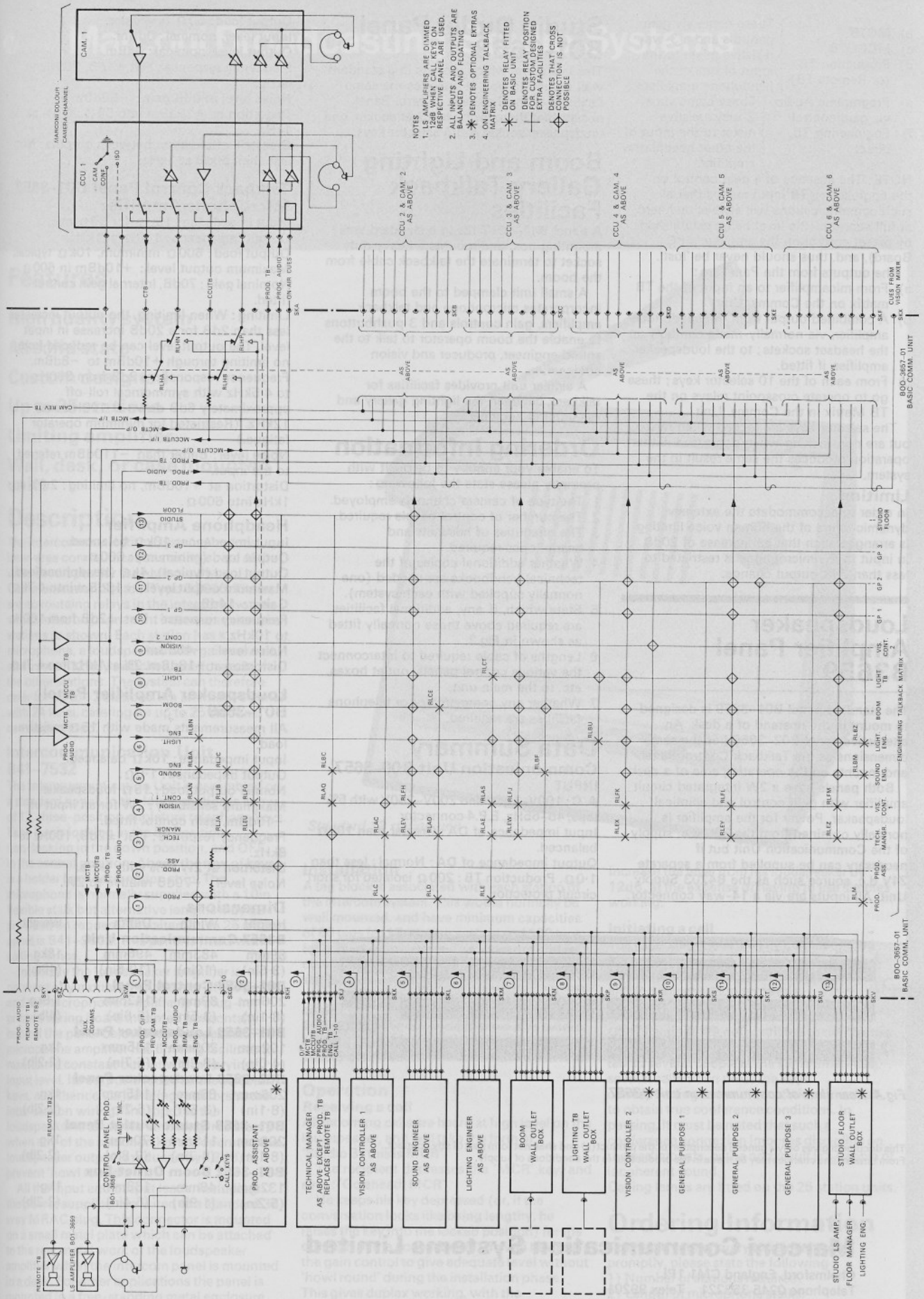


Fig.3 Facilities diagram. Communication System Type B3656

- b) MCTB
- c) MCCUTB
- d) Production TB (or Remote TB)
- e) Programme Audio, via gain control
- f) Engineering TB, direct

These come via gain controls and a 3-way resistive mixer to the input of one of the headphone amplifiers.

These come via a 2-way resistive mixer to the input of the other headphone amplifier.

NOTE: The absence of a gain control on the Engineering TB input means that all such communications will always be heard at full strength (the level being established by preset control on the amplifier's PC Board), and, thus should never be 'lost'.

The outputs from the Panel are:

- a) From mic amplifier to an input of the TB matrix on the Comms. Unit.
- b) A combined output from the headphone amplifier, via normally-made contacts on the headset sockets; to the loudspeaker amplifier, if fitted.
- c) From each of the 10 selector keys; these go to operate crosspoint relays on the TB Matrix in the Comms. Unit.

The selector keys are locked when raised, but are non-locking when depressed. Either operation produces the same result in the system.

Limiting

In order to accommodate the extensive dynamic range of the human voice limiting is arranged such that an increase of 20dB in input to the microphone is restricted to less than 2dB output change.

Loudspeaker Amplifier Panel B3659

The standard panel B01-3659 is designed to mount in the upstand of a desk. An alternative panel B02-3659 has the same dimensions as the Talkback Control Panel, and mounts on the operating area of a desk.

Both panels have a 2W integrated circuit amplifier with gain control and elliptical loudspeaker. Power for the amplifier is normally obtained from the 30V d.c. supply of the Communication Unit but if necessary can be supplied from a separate 24V d.c. source such as the B4203 Supply Unit. All inputs are via a 14-way connector.



Fig.4 Rear view of communication unit B3657

This document gives only a general description of the product(s) and shall not form part of any contract. From time to time changes may be made in the products or in the conditions of supply.

Studio Outlet Panel B01-3663

This is a panel which mounts in a standard wall mounting box. It provides the same facilities as the Talkback Control Panel, except that there is one headset socket, one loudspeaker socket and 5 selector keys.

Boom and Lighting Gallery Talkback Facilities

A panel B41-6917 fits in a standard wall mounting box, and mounts a heavy duty socket to terminate the talkback cable from the boom.

A small unit clamped to the boom incorporates microphone and talkback amplifiers, gain controls and 3 pushbuttons to enable the boom operator to talk to the sound engineer, producer and vision engineer.

A similar unit provides facilities for talkback between the lighting gallery and the lighting engineer.

Ordering Information

To enable your enquiry to be dealt with promptly please state the following:

- 1 The type of camera channels employed.
- 2 The number of control panels required.
- 3 The quantities of headsets and headphones required.
- 4 Whether additional copies of the technical handbooks are needed (one normally supplied with each system).
- 5 State which, if any, additional facilities are required above those normally fitted as shown in Fig.3.
- 6 Lengths of cable required to interconnect the various control panels, outlet boxes, etc. to the main unit.
- 7 Whether any commentator or telephone facilities are required.

Data Summary

Communication Unit B00-3657

INPUT

A.C.: 100V-125V and 200V-250V with 5% taps, 45-65Hz, E.P.4 connector

Input impedance of DA: Greater than 10k Ω balanced.

Output impedance of DA: Normal; less than 1.0 Ω . Production TB: 200 Ω isolated for short circuit protection.

Output load: 50 Ω or greater.
Input level, nominal: 0dBm.
Output level, nominal: 0dBm.
Frequency response: Flat ± 1 dB, 200Hz to 5kHz.
Noise level at 0dB gain: -50dBm.
Distortion at +10dBm into 50 Ω : 0.5% at 1kHz.
Crosstalk attenuation between outputs: Not less than 60dB at 1kHz.

Talkback Control Panel B01-3658 Microphone Amplifier

Input impedance: 150 Ω for 30 Ω mic.
Output impedance: 100 Ω at 1kHz.
Output load: 600 Ω minimum, 10k Ω typical.
Maximum output level: +10dBm in 600 Ω .
Nominal gain: 70dB, internal gain control fitted.

Limiting: When limiting, the output increases less than 2dB for a 20dB increase in input level. The output level can be reduced from no limiting through +10dBm to -8dBm.
Frequency response: ± 2 dB from 300Hz to 4.5kHz with symmetrical roll-off approximately 6dB down at 100Hz and 12kHz. (Restricted for minimum operator fatigue.)

Noise level: Better than -110dBm referred to the input.
Distortion at +10dBm, no limiting: 2.0% at 1kHz into 600 Ω .

Headphone Amplifier

Input impedance: 10k Ω balanced.
Output load (minimum): 600 Ω .
Output load (typical): 4k Ω (headphone load).
Maximum output level: +16dBm into 4.7k Ω .
Gain: > 14dB.
Frequency response: Flat ± 2 dB from 100Hz to 10kHz.
Noise level: -45dBm.
Distortion at +18dBm, 2% at 1kHz into 4.7k Ω .

Loudspeaker Amplifier Panel B01-3659

All measurements made with 15 Ω resistive load.

Input impedance: 10k Ω balanced.
Output impedance: 1.0 Ω .
Normal output load: 15 Ω loudspeaker.
Maximum sensitivity: 2W for an input of -10dBm, gain control fitted.
Frequency response: Flat ± 2 dB, 100Hz to 8kHz.
Distortion at 2W: 2% with 1kHz.
Noise level: -70dB relative to 2W.

Dimensions

Height	Width	Depth	Weight
B3657 Communication Unit			
89mm	483mm	496mm	18kg
(3.5in)	(19in)	(19.5in)	(40lb)
B01-3658 Control Panel			
206mm	89mm	142mm	1.9kg
(8.1in)	(3.5in)	(5.6in)	(4lb)
B01-3659 Loudspeaker Panel			
102mm	209mm	145mm	1kg
(4.0in)	(8.2in)	(5.7in)	(2.2lb)
B02-3659 Loudspeaker Panel			
206mm	89mm	145mm	1kg
(8.1in)	(3.5in)	(5.7in)	(2.2lb)
B01-3663 Studio Outlet Panel			
206mm	119mm	70mm	1kg
(8.1in)	(4.7in)	(2.8in)	(2.2lb)
B01-3662 Boom Outlet Box			
132mm	48mm	163mm	1kg
(5.2in)	(1.9in)	(6.4in)	(2.2lb)

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TD-3-B3650