

# **BECKER**

AVIONIC SYSTEMS

**Handset**

**ST 3100-(60)-02**

## **Installation and Operation**

Manual DV 31606.03

Issue 2 Jan. 1991

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FIRST ISSUE AND CHANGES

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**Section 1 GENERAL INFORMATION**

**1.1 Introduction**

The manual describes the Handset ST 3100 - (60) - 02 of the BECKER Audio Selector and Intercom System ASI 3100. The manual DV 31606.03 ("Installation and Operation") and DV 31606.04 ("Maintenance and Repair") contains the following sections :

Section		DV 31606.03	DV 31606.04
1	General Information	X	X
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**1.2 Application**

The handset ST 3100 - (60) - 02 with the support bracket HC 3100-(60) - 02 is part of the Audio and Intercom System ASI 3100 and is suitable for installation in aircraft together with the junction box JB 3100-(17) and the audio selector unit AS 3100-(27A).  
 The handset can be used for intercommunication with the flight deck and also for PA announcements in the cabin.

### **1.3 General description**

The handset and the support bracket are parts of the aircraft intercommunication system, facilitating intercommunication within the aircraft and passenger address announcements.

#### **1.3.1 Mechanical description**

A handset unit comprises the handset itself and the support bracket. The two parts are connected together by a grey coiled cable.

The support bracket is made of soft grey polycarbonate and contains the unit connector and two permanent magnets for activating the ON/OFF reed switch. Two mechanical detents are also provided for the handset.

The handset itself comprises two soft grey polycarbonate casing halves and contains a mike capsule, a phone capsule, the keyboard with the circuit board beneath and the generator/ amplifier board.

#### **1.3.2 Electrical description**

The cabin handset type can be used for telephonic communication within the aircraft and also for PA announcements in the cabin. The unit work in the AF frequency range between 300 Hz and 6 kHz.

The microphone amplifier amplifies the microphone signal to 800 mV. A bandpass limits the frequency range to between 300 Hz and 6 kHz.

The cabin handset type is equipped with a keyboard having 6 dialling pushbuttons.

When a dialling key is pressed, the DTMF generator generates the appropriate dual-tone frequency that is transmitted by way of the AF amplifier to the AF output of the unit.

When a dialling key is pressed, the microphone signal to the AF output of the unit is muted.

The AF amplifier amplifies both the microphone signal and the various dual-tone frequencies. The signals are decoupled by way of the same AF output.

When the reset button is pressed, an electronic switch disconnects the AF output and the power supply to the unit.

When the handset is placed in the support bracket, a reed switch disconnects the AF output and the power supply of the unit.

The handset works with a nominal 15 V DC power supply.

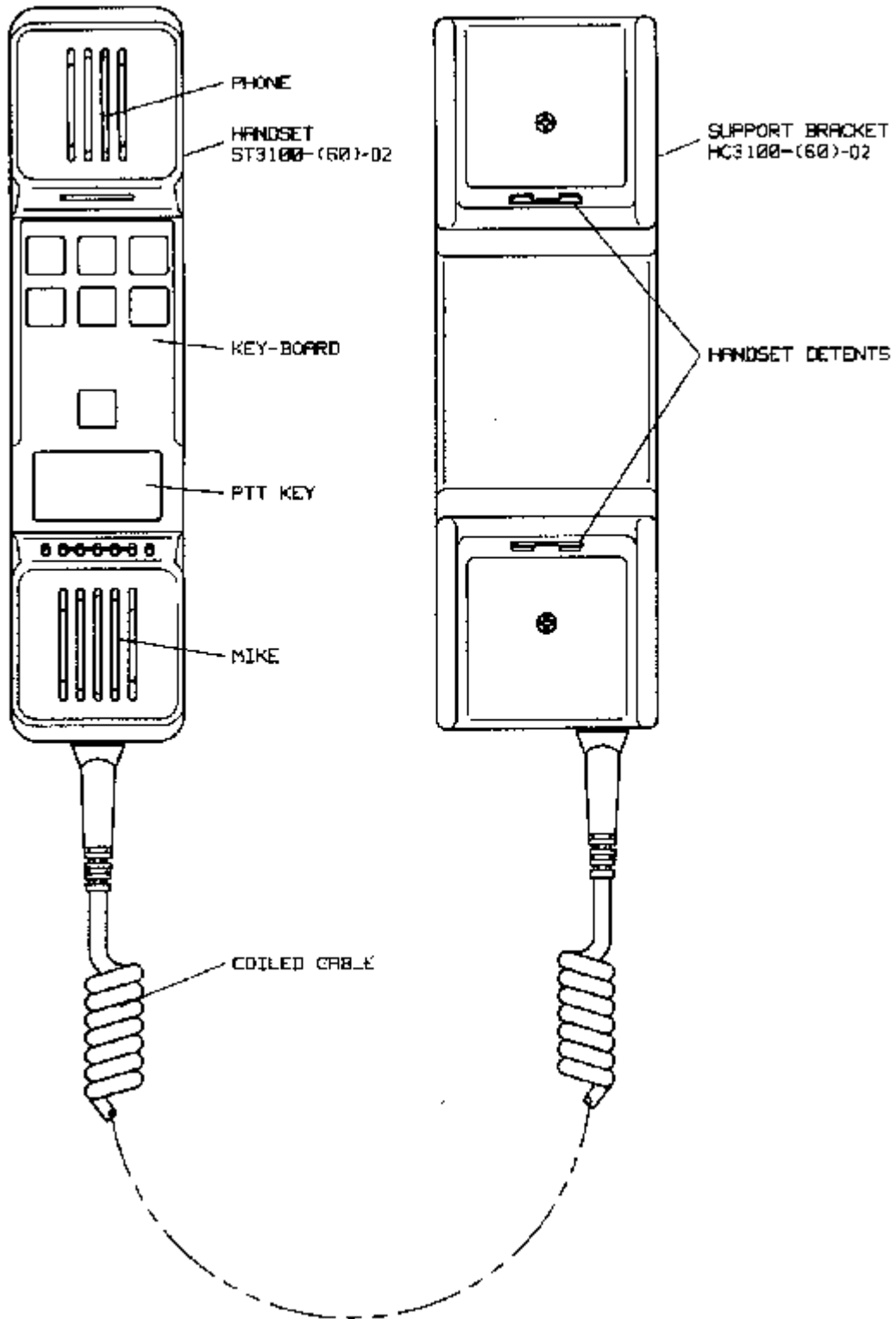


Fig. 1-1 Handset and support bracket

## 1.4 Technical Data

### 1.4.1 General

Power supply	+ 15 V DC $\pm$ 10 %
Current consumption	approx. 50 mA in talk mode
Handset dimensions	215 x 50 mm
Support bracket dimensions	208 x 67 x 44 mm
Weight (total)	$\leq$ 550 g (handset and support bracket)

### 1.4.2 Environmental conditions

Operating temperature	-15 ° C ... +70 ° C (operable)
Storage temperature	- 55 ° C ... +85 ° C
Humidity	up to 95 % at 50 ° C
Altitude	15000 ft (4572 m) (operable)
Vibration	max. 0,76 G (operable)
Shock	6 G (operable)
Acceleration	9 G (operable)

### 1.4.3 Microphone with preamplifier

Frequency response	300 Hz . . . 6 kHz ( $\pm$ 6 dB) referred to 1 kHz
Distortion	$\leq$ 10 % at 15 V DC
Sensitivity (output level)	800 mV $\pm$ 10 % at 114 dB SPL (Sound pressure level) and 1 kHz and 15 V DC (talk mode)
DTMF (output level)	$\geq$ 1.6 V <sub>pp</sub>
Sensitivity adjustment	$\pm$ 6 dB (adjustable with R 35)
Impedance	80 $\Omega$ $\pm$ 20% nominal at 15 V DC
Noise level	$\leq$ - 60 dB ref. to 800 mV
Hum	$\leq$ 5 mV



#### **1.4.4 Earphone**

Frequency response	300 Hz ... 4.5 kHz ( $\pm 6$ dB) (referred to 1 kHz)
Distortion	$\leq 5$ % at 10 mW (300 Hz ... 4.5 kHz)
Sensitivity	105 dB SPL $\pm 3$ dB at 0.775 V/ 1 kHz
Sensitivity adjustment	-10 dB (adjustable with R 26)
Impedance	600 . . . 2100 $\Omega \pm 10$ %

#### **1.4.5 Push to talk and reed switch**

Push to talk switch (PTT):

- Switch life	300.000 operations
- Resistive load	28 V DC 0.5 A

ON/OFF reed switch:

- Switch life	100.000 operations
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#### **1.4.6 Unit connector type**

9-pin D-sub type, with spring latch assemblies

### **1.5 Scope of delivery**

Handset ST 3100 - (60) - 02 P.N.: 846.368-921

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## **Section 2 INSTALLATION**

### **2.1 General**

The installation of the handset and support bracket depends on the type of aircraft and its equipment. For this reason, only generally applicable information can be provided in this section.

Before installing the handset and support bracket in an aircraft, a visual inspection should be carried out in order to determine any damage which the unit may have incurred during transport, paying particular attention to the following defects:

1. Dents, scratches, broken fastenings, damage to housings or housings parts.
2. Dirt and scratches on type plate.
3. Dirty, bent or broken pins, cracked bushings, burning on male or female contacts.
4. Pushbuttons that are dirty, mechanically damaged or not freely moving.
5. Damage to the capsule protection felts.
6. Loose seats, missing screws and washers.
7. Handset detents that are dirty or mechanically damaged.

### **2.2 Changing of the key caps**

#### Disassembly of the keyboard:

Insert the disassembly aid first in the left and then in the right-hand gap and release the cover plate from the keyboard.

Remove the key caps and key springs.

#### Assembly of the keyboard:

Place the key spring for each cap on the keyboard. Attention : Two springs are required for the PTT button. Place key caps on the keyboard. Slide the cover plate over the key caps and lock into place on both sides.

### **2.3 Mechanical installation**

Disassembly the support bracket for installation of the handset:

- a. Remove the two screws and washers from the support case.
- b. Remove the support case from the support baseplate.
- c. Remove the coiled cable with unit conctor and the connector plate from the baseplate.
- d. Attach the baseplate in the aircraft by means of two screws.

Assembly of the support bracket after installation:

- a. Insert the connector plate and the anti-kink device of the coiled cable with unit connector into baseplate and snap into place.
- b. Join the support case and baseplate and fasten with screws and washers

The necessary installation dimensions of the handset see figure 2-1.

## 2.4 Aircraft wiring

### 2.4.1 General information

The aircraft wiring of the handset differs depending on the type of aircraft and equipment. For this reason, only generally applicable information can be provided.

#### NOTE

The signal lines should be screened and twisted and provided with a common shield for uncertain EMC conditions.

### 2.4.2 Pin connection of the unit connector

Plug: P1

Connection :	Pin No.:
Phone audio input (HI)	1
Phone audio input (LO)	2
Shield	3
Mike and DTMF audio output and supply voltage input (HI)	4
Mike and DTMF audio output and supply voltage input (LO)	5
PTT-Key line (HI)	6
PTT-Key line (LO)	7
Spare	8
Spare	9

CONNECTOR WIRING SIDE  
 9 - pin D - sub male type

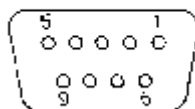


Fig. 2-1 Connector pin location

## **2.5 Test after installation**

### **2.5.1 Post-installation check**

Remove the handset from the support bracket. Press the key, lettered with PA. A chime must be audible in the cabin via the cabin speakers if a Junction box JB 3100-(17) and a PA-amplifier PA 3100-(11) is installed in the aircraft. Press PTT key and speak into the microphone. The announcement must be audible in the cabin.

Press the Reset key and after that the key, lettered with CAPT. The chime must be audible in the in the headphone or cockpit speaker at the flight deck. Press the PTT key and carry out talk-listen check between handset and flight deck.

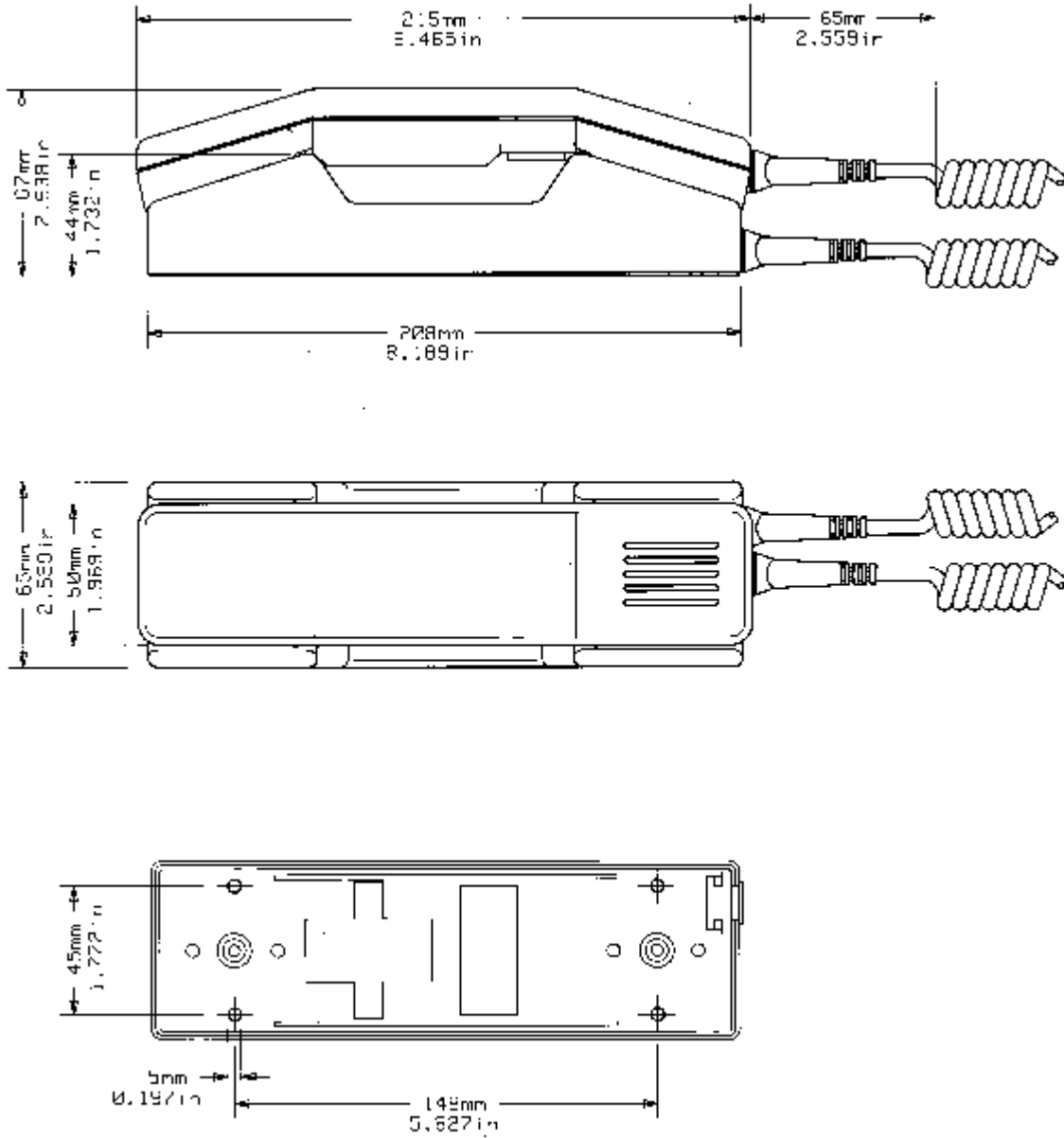


Fig. 2-2 Installation dimensions (mm)



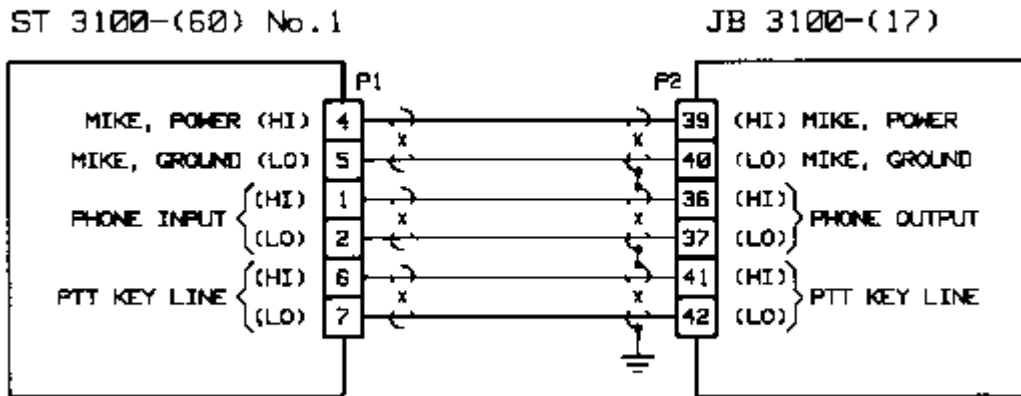


Fig. 2-3 Interwiring of the Handset No. 1 with Junction Box JB 3100 - (17)

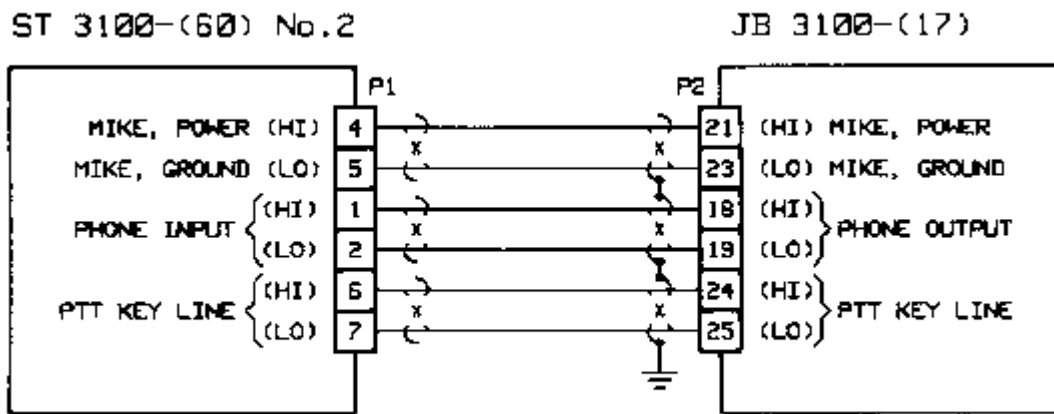


Fig. 2-4 Interwiring of the Handset No. 2 with Junction Box JB 3100 - (17)

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**Section 3 OPERATING INSTRUCTIONS**

**3.1 CONTROLS**

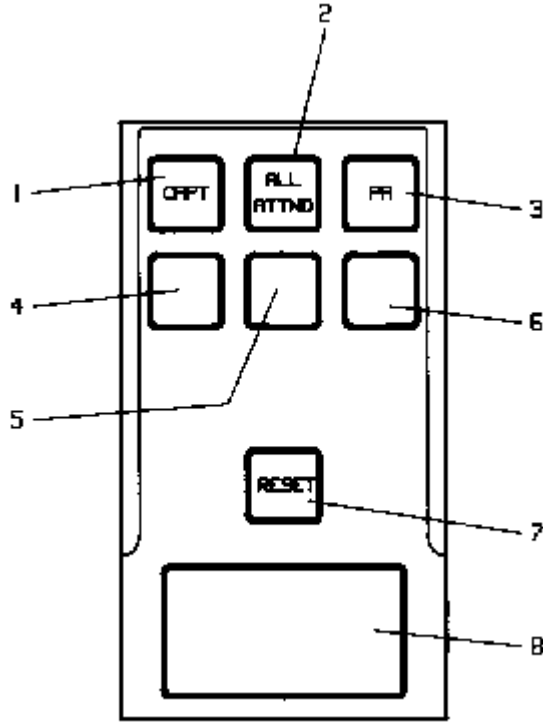


Fig. 3-1 Front view of the keyboard

**3.2 Description and function of controls**

Controls and indicator	Description	Function
Key No. 1, lettered with CAPT	Pushbutton	Cockpit call and switching through of the audio line to the cockpit handset
Key No. 2, lettered with ALL ATTND	Pushbutton	Dialling key for ALL ATTENDANTS
Key No. 3, lettered with PA	Pushbutton	Chime activation and PA announcement
Key No. 4, 5, 6 (blank)	Pushbuttons	Dialling keys, no functions

Controls and indicator	Description	Function
Key No. 7 lettered with RESET	Pushbutton	Disconnets the communication cockpit handset or PA-Amplifier
Key No. 8	Pushbutton	PTT-key

### 3.3 Operating instructions

#### 3.3.1 Telephone communication

Intercommunication between cabin and cockpit :

1. Remove handset from support bracket.
2. Dial the required connection by briefly pressing the appropriate key CAPT.
3. Press the PTT-key (keep it pressed) and speak into the microphone.
4. On completing the communication press the RESET button or replace the handset and clip it in.

**NOTE**

Incoming calls are indicated by a call tone in the headphone or cockpit speaker.

#### 3.3.2 PA announcements

1. Remove handset from support bracket.
2. Press briefly the button PA
3. Press the PTT-key (keep it pressed) and speak into the microphone.
4. On completion of the PA announcement press the RESET button or replace the handset and clip it in.