Bantam Installation Guide

Kit: Bantam Installation Kit P/Ns 900-1047-000 900-1048-000 900-1052-000 900-1054-000

Read and Follow Safety Messages

- · In these instructions, you may see the heading
- WARNING and/or the safety alert symbol **A**. They indicate a hazardous situation that, if not avoided, could result in death or serious injury. The safety messages provide information to identify a hazard associated with potential injury.
- Before installing, operating, or performing maintenance or service on any part of the system, read and understand this installation guide.
- Keep these instructions and all related safety information with the manuals for your aircraft and other equipment.

If you have questions or need assistance, contact your local dealer or distributor.

Overview

This installation guide lists all the parts in the kits and provides step-by-step instruction on how to install the Bantam CPU, touchscreen, lightbar, antenna and associated cabling and switches.

Please read this manual thoroughly before beginning the installation. Observe all warnings.

WARNING: Plan your installation by considering the following:

- Cable lengths
- Clearance space
- Power source
- Aircraft structure
- Visibility
- Balance (see "Component Weights" on page 5 for weight of major components)

WARNING:

Consider using existing hardware and hardware locations. Avoid drilling holes that may damage other equipment (such as structural frame members, electrical cables, or fluid lines).

WARNING:

Do not obstruct the view of, or access to, other instruments or the flying visibility of the operator.



Kit Contents - Box 900-1054-000 - Bantam CPU, Antenna, Ancillary Items, Documentation

Unpack this kit and identify the parts as shown. Kit items are referenced A, B, C etc. with a C prefix for CPU (and CPU-associated items). References are used in the installation steps and pictures.

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
CA	806-1034-000#	1	Bantam CPU	
СВ	804-3036-000#	1	A21 air antenna	Anglunction Tax
N/A	Appendix	1	Template (Appendix, page 15)	
			(Optional: Remove the appendix from this doc- ument and use the template to mark the aircraft for drilling for CB.)	0 0 05 0 0 0 CENTERINE 0 0 0 0 0 0 0 0
CC	051-0244-000#	1	GPIO cable	
			(Connect to [e.g.] spray switches, swath advance)	
CD	052-0005-000#	1	Antenna cable, TNC(M)-TNC(M), 5 m	
			(Connect antenna CB to CA)	
CE	726-1096-000#	1	Power cable harness	
			(Includes mountable panel with power switch [for CA], circuit breaker and dimmer switch to control the lightbar brightness.)	
Docume	ntation			
	876-0255-000	1	This installation guide	
	875-0342-000	1	AirTrac Quick Reference Guide	
Bag 880-1031-000 - Ancillary Items				
CF	750-1079-000	1	USB drive, 2 GB	
			(Use in CH or directly into CA)	C X Agunetons

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
CG	051-0234-000	1	USB extender cable, 5 m (Use with CH for CF or CM)	
СН	400-0127-000#	1	Panel mount USB socket with cover (Use with CG for CF or other USB; install with CI)	
CI	683-1086-000	1	Shell gasket (Install on the back face of CH - so against the mounting surface)	0
CJ	675-0128-000#	1	USB drive cover, splash-proof (For when a USB drive is left in the CPU)	000000
СК	075-4001-000#	1	Switch, lever, SPDT MOM CONT (Boom pressure - connect to cable CC)	18805 71-04 18805 71-04
CL	075-4002-000	1	Switch, push, SPDT, 125 V 6 A RB (Swath advance/mark - connect to cable CC)	
СМ	710-0118-000 (Bag)	1	USB drive, MapStar loaded (Bagged kit)	C X Agiurciano

Kit Contents - Box 900-1054-000 (continued)

Kit Contents - Box 900-1047-000 (7") or 900-1048-000 (9") Touchscreen and Cable

Unpack this kit and identify the parts as shown. Kit items are referenced A, B, C etc. with an S prefix for Screen (and screen-associated items). References are used in the installation steps and pictures.

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
SA1	752-0001-01#	1	Touchscreen, 7"	SATLOC
SA2	750-0133-001#		Touchscreen, 9"	
SB	051-0326-000#	1	Cable, video (7" and 9")	
			(Connect SA to CA)	

Kit Contents - Box 900-1052-000 - Lightbar, Mounting Brackets and Hardware

Unpack this kit and identify the parts as shown. Kit items are referenced A, B, C etc. with an L prefix for Lightbar (and lightbar-associated items). References are used in the installation steps and pictures.

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
LA	806-2018-000#	1	L7 lightbar	1 226 B2B 40
LB	051-0022-001	1	Lightbar cable	
			(Connect LA to CPU [CA])	

Bag 710-0029-002 - Lightbar Mounting Brackets and Plates (includes bag 710-0018-001)				
LC	602-1007-000#	4	Mounting bracket, 1"	
			(Mount LA. Use LC/LC or LC/LD combination - see steps)	
LD	602-1008-001#	2	Mounting bracket, 3"	
			(Mount LA using LC/LD combination - see steps)	

Kit Contents - Box 900-1052-000 - Lightbar, Mounting Brackets and Hardware (continued)

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
LE	601-1045-000#	2	Backing plate	
			(Use with LH if required - see steps)	
Bag 710-	-0018-001 - Lightbar Mou	nting Hardv	vare (in bag 710-0029-002)	
LF	675-1083-000	6	Bolt, #10-32 x 5/8"	
	678-1038-000#	6 (of 14)	Washer, internal star, #10-32	TTTTTT
	676-1022-000#	6 (of 10)	Nut, nyloc, #10-32	
			(Bolt mounting brackets LC/LC or LC/LD together—whichever combination used)	000000
LG	675-1086-000#	4	Bolt, #10-32 x 1/2"	
	678-1038-000#	4 (of 14)	Washer, internal star, #10-32	
			(Attach mounting bracket combination LC/LC or LC/LD to lightbar)	0000
LH	675-1084-000	4	Bolt, #10-32 x 3/4"	
	(675-1085-000)	(4)	(Bolt, #10-32 x 1-3/4" - optional)	TTTTTT
	678-1038-000#	4 (of 14)	Washer, internal star, #10-32	0000
	676-1022-000#	4 (of 10)	Nut, nyloc, #10-32	0000
			(Attach mounting bracket combination LC/LC or LC/LD to aircraft. Use LE if necessary.)	

Component Weights

Component	Weight
CPU	4.05 lbs (1.83 kg)
Touchscreen - 7"	2.30 lbs (1.04 kg)
Touchscreen - 9"	2.85 lbs (1.29 kg)
L7 lightbar	4.35 lbs (1.97 kg)
Complete cable set	8.55 lbs (3.88 kg)
A21 antenna	0.8 lbs (0.36 kg)

CPU Installation

The CPU (CA) has no quick release mechanism-it is a semi-permanent fixture once installed.

Install the CPU in any location inside the aircraft that has the necessary room and is sheltered from the elements, for example in a storage compartment or in the cab or behind the seat. The CPU must have sufficient clearance to be accessible for attaching/removing cables (front and both sides) and for inserting and removing the USB drive. Obtain the appropriate hardware to secure the CPU through its fitting points at each corner and install it in your selected location.



Touchscreen Installation

Mount the touchscreen inside the cockpit where it is easily visible while flying and comfortably within arm's reach.

WARNING:

WARNING:

Do not obstruct the view of, or access to, other instruments or the flying visibility of the pilot.

Before drilling into the instrument panel at step, make sure there is nothing that can be damaged by the drilling. Secure anything that could be damaged away from where the drill bit and screws come through.

Mount the touchscreen

a. After selecting a suitable location, use the touchscreen as a template to mark the mounting surface at the four corner holes. Drill four holes as marked.

AWARNING:

At the next step, use only #8 screws to mount the touchscreen; larger screws could crack or otherwise damage the screen.

b. Using suitable length #8 screws (only, see preceding warning), attach the screen to the instrument panel. Figures 1 and 2 show an example touchscreen installation using a fabricated mounting bracket.



Figure 1: Fabricated bracket installation



Figure 2: 9" touchscreen installation

Lightbar Installation

Mount the lightbar in front of the cockpit at a comfortable viewing distance. You can mount the lightbar either inside or outside the cockpit.

AWARNING: Do not obstruct the view of, or access to, other instruments or the flying visibility of the pilot.

NOTE: This installation requires some drilling—you will need a 1/4" drill bit.

1. Assemble the lightbar mounting brackets. Using hardware LF assemble either:

- Two 1"/1" (LC/LC) bracket combinations (Figure 1-i) or
- Two 3"/1" (LD/LC) bracket combinations (Figure 1-ii).



Figure 1-i: Mounting brackets (LC/LC)



Figure 1-ii: Mounting brackets (LD/LC)



Figure 2a: Lightbar on brackets (LC/LC shown)



Figure 2b: Lightbar on aircraft—backing plates used (LC/LC shown)

2. Mount the lightbar.

- a. Using hardware LG (not visible), attach the lightbar to the assembled brackets (Figure 2a - LC/LC bracket combination shown).
- b. Using the assembled lightbar and brackets as a template, mark the four mounting hole positions on a suitable surface/location on the aircraft. Using a 1/4" drill bit, carefully drill the four holes.
- c. Using hardware LH (short or long bolts as required) secure the lightbar (Figure 2b LC/LC bracket combination shown). If required, use the backing plates LE on the underside of the mounting surface for additional reinforcement: they provide additional support to prevent the bolts pulling through the surface under vibration.

AWARNING: Do not obstruct the view of, or access to, other instruments or the flying visibility of the pilot.

Mount the power panel—part of power cable harness **CE** (726-1096-000#)—in an appropriate location inside the cockpit within the pilot's easy reach (but see preceding warning). Depending on the selected location, use appropriate hardware (not supplied) to secure the power panel. See step "About the power cable harness", page 11.



The touchscreen has its own power button but it works as an on/off switch only when **CE**'s power switch is ON.



Power panel (comprising on/off switch, lightbar dimmer and fuse circuit breaker) - part of cable CE.

Antenna Installation

AWARNING: Positioning the antenna less than 5 ft (1.524 m) from transmitting antennas of any frequency may cause overloading of the RF circuits.

Install the antenna

NOTE: Antenne warnin

Antenna position (and antenna cable routing—see warning below) is critical to system performance. The following conditions must be met for proper system operation:

- Mount the antenna (CB) at least 5 ft (1.524 m) from transmitting antennas of any frequency see warning above.
- Mount the antenna at the highest practical point that will give a good view of the horizon.
- The positions that the receiver calculates are at the positions of the antenna, so, if using a swath guidance system, mount the antenna on the centerline of the aircraft.

NOTE:

This installation requires some drilling—you will need 1/8" and 7/16" drill bits.

Meeting the conditions described above, mount the antenna:

- a. (Optional) If using, place the template (Appendix, page 15) on a suitable place on the aircraft's surface and mark the drilling spots for the holes for the antenna fixing hardware (not supplied) and the antenna cable **CD**. (Use your own method, if preferred.)
- b. Using a 1/8" drill bit, carefully drill the four screw holes.
- c. Using a 7/16" drill bit, carefully drill a hole for the antenna connector.
- d. Secure the antenna to the aircraft with four #8-32 screws (not supplied).



Antenna mounting template (see Appendix)

WARNING:

- Never connect or disconnect the antenna cable with the power on.
- Do not route the antenna cable with any other radio system cables; this will cause interference. Keep antenna cable/radio cables at least twelve inches apart.
- If the antenna cable must cross other cables, cross it at 90°. This will prevent interference between systems.

Cable(s) and Switches Installation/Connections

AWARNING:

• Store excess cable lengths with a minimum six-inch bend radius.

USB drive, panel mount connector (CH) 400-0127-000#

- Do not coil cables (introduces noise).
- Avoid high-temperature exposure (for example the exhaust, exhaust manifold) when routing.
- Finger tighten cables only—do not use tools. Plug the connector into its port and turn the connector ring to secure.

The schematic below shows the main components and their connections. Detailed notes on the connections begin on page 10.

and USB extension cable (CG) 051-0234-000 Antenna (CB) 804-3036-000# (to either port) Antenna cable (CD) 052-0005-000# (to antenna CB) Flow control port - for your flow control system's cable Power cable harness (CE) 726-1096-000# (w/power panel) GPIO cable (CC) Lightbar cable (LB) Video cable (SB) 051-0022-001 051-0244-000# 051-0326-000# (to lightbar LA) (to spray on/off switch, (to touchscreen SA) swath advance switch, serial connector [DB9]) Lightbar (LA) 806-2018-000#

Touchscreens (SA) 752-0001-01# (7") / 750-0133-001# (9")

Cable Connections

You install each Bantam cable between the CPU and a modular component, for example the antenna cable or the touchscreen, or a peripheral device. Each cable is labeled with its name and part number and the connections are color coded. Each cable can fit only one port on the CPU—it is impossible to connect a cable to the wrong port. Line up a connector with its matching pins and gently insert and turn.

AWARNING: General cable connection warnings:

- Turn off power before connecting or disconnecting cables.
- Finger tighten cable connections—do not use tools.
- Do not route cables alongside power generator wire and other high-noise electric sources (will cause interference).
- Ensure no chafing of cables can occur.
- Do not kink or force cables into sharp bends.
- Store excess cabling with at least a six-inch bend radius; if coiling cables, flatten out the loops into ellipses (coiling in circles introduces noise).
- Avoid routing cables near high-temperature components (for example the exhaust, exhaust manifold).
- Cross the antenna cable (if necessary) at 90° to any other cable (prevents cross-interference).

1. Connect the GPIO cable.

WARNING:

Never force cable connections, finger-tighten only (do not use tools).

The GPIO cable **CC** (051-0244-000#) comprises several individual cables: for the spray on/off switch, the swath advance switch, a serial port (DB9) connector (Figure 1a).

a. Connect the Conxall connector end of **CC** to the CPU serial port labeled 'GPIO'.

AWARNING:

Do not connect spray on/off leads to a flow system if it contains live voltage. Connection to a DC voltage will damage the circuit.

- b. Connect CC's spray on/off switch cable leads to the provided lever switch CK (075-4001-000# Figure 1b). Use the switch in conjunction with your spray system on/off controls to synchronize actual spraying with the spray data collection functionality of Bantam. See also step 5 "Connect to the flow control port.", page 11.
- c. (Optional) Connect CC's swath advance cable leads to push switch **CL** (075-4002-000) to control swath advances remotely.

2. Connect the lightbar cable.

- a. Connect the Conxall connector of the lightbar cable LB (051-0022-001) to the CPU port labeled 'LIGHTBAR' (Figure 2).
- b. Connect the metal Bendix connector on **LB** to the matching connector on the back of the lightbar.



Figure 1a: GPIO/power cable 051-0244-000# and CPU 'GPIO' port



Figure 1b: Lever switch 075-4001-000#



Figure 2: Lightbar cable 051-0022-001 and CPU 'LIGHTBAR' port

3. Connect the antenna cable.

Connect the antenna cable **CD** (052-0005-000#) between the socket on the left side of the CPU and the A21 antenna (Figure 3).

4. (Optional) Connect a keyboard and/or mouse.

For troubleshooting purposes, for example, you can connect a keyboard and a mouse directly or indirectly (through an extension cable) to the USB ports on either side of the CPU (Figure 4).

5. Connect to the flow control port.

Connect the cable that comes with your flow control system—IntelliFlow or IntelliGate—to the flow control port (Figure 5).

6. Connect the video (VGA) cable.

- a. Connect the Conxall connector on video cable **SB** (051-0326-000#) to the CPU port labeled 'DIS-PLAY' (Figure 6).
- b. Connect the other end of **SB** to the connector on the back of the touchscreen.

About the power cable harness



See power cable warnings next page.

The power cable harness **CE** (726-1096-000#) includes a power panel that has (Figure 7):

- An ON/OFF switch
- A dimmer switch to control the lightbar's brightness.
- A 3 A (max) circuit breaker that prevents voltage spikes and reverse polarity from damaging the system.



CE's ON/OFF switch powers the CPU and the touchscreen. The dimmer switch on the power panel controls lightbar brightness.



Figure 3: Antenna cable 052-0005-000# and CPU antenna connection



Figure 4: USB ports for input devices



Figure 5: CPU 'FLOW' port



Figure 6: Video (screen) cable 051-0326-000# and CPU 'DISPLAY' port



Figure 7: Power cable harness 726-1096-000# and CPU 'POWER' port

AWARNING: *Power cable: source and polarity*

- Do not connect to a power source of less than 10 V.
- Do not use a cigarette lighter as a permanent power source.
- Do not reverse the polarity of the power *leads—incorrect installation can damage the* system. Connect RED to POSITIVE (+) and BLACK to NEGATIVE (-).

AWARNING: Power cable: and CEMF

A potential problem when installing an electronic system in any vehicle is counter electromagnetic force (CEMF). CEMF is caused when relays or solenoids connected to the common aircraft DC power bus are de-energized. The voltage produced may exceed 400 V. CEMF can be produced by equipment such as:

- Electric fan brakes and air conditioners
- Starter relays and electric pump relays

To eliminate CEMF, install diodes at the relays and solenoids that cause the CEMF and at the power supply cable connection of the Bantam system. Use a 47 V, 5 W Zener Diode (1N5368 or equivalent).

7. Connect the power cable harness.

- Connect the Conxall connector of power cable hara. ness CE to the CPU port labeled 'POWER' (Figure 7).
- b. Connect the red and black power leads to a suitable power source that can supply between 10 and 36 V (for example, aircraft battery, generator).

8. Install the USB panel mount and connect the USB extension cable.

The Bantam system comes with a 2GB USB drive (CF) for logging and for transferring files (and a USB drive [CM] with MapStar loaded). To provide easy access to one of the CPU's USB side ports, kit part number 880-1031-000 includes USB socket panel mount CH (400-0127-000#) and extender cable CG (051-0234-000) (Figure 9).

- Using your own hardware, attach panel mount CH a. accessibly to a cockpit surface with gasket CI between the panel mount and the mounting surface.
- Install extender cable CG between the panel mount b. and one of the CPU's USB side ports.



You can use the other USB side port for a peripheral device such as a wireless modem, tracking device, keyboard or mouse.

To use the USB drive, you must insert it into the NOTE: CPU (using the remote socket CH as required) before turning the system on. If you start the system before inserting the USB drive, turn off the Bantam*, insert the USB drive and restart the system. (*Always turn off the Bantam before removing the USB drive.)



Figure 7: Power cable harness 726-1096-000# and CPU 'POWER' port



Figure 9: USB panel mount and cover, gasket and extender cable

9. Powering the system.

The ON/OFF switch on the power panel (Figure 10, part of **CE**—see step 7, "About the power cable harness" and step 8 "Connect the power cable harness." on page 12) provides power to the CPU and to the touchscreen (but note that the touchscreen has its own ON/OFF power button, which works so long as the lever switch in ON).

- a. Turn on the aircraft's main power source (aircraft battery, generator, other) and set the ON/OFF lever switch on the power panel to ON. This powers up all components.
- b. When the system is powered up it will start the Windows-based AirTrac software.
- Refer to the AirTrac Quick Reference Guide (875-0342-000) and the AirTrac User Guide (875-0105-001) supplied with this kit for detailed descriptions of the software features and step-bystep instructions on how to use them for basic and advanced operations.

10. Adjusting the lightbar brightness.

Adjust the lightbar brightness by turning the lightbar DIMMER control knob on the power panel (part of CE).



Figure 10: 'Power panel' of power cable harness 726-1096-000#



Figure 11: The lightbar dimmer on the power panel



Before turning off the touchscreen or the main power source, it is important to shut down AirTrac and Windows by following this procedure.

- a. Press KEYPAD > CLEAR > CLEAR, a confirmation/ option screen appears. Choose:
 - NO (cancel exit, return to AirTrac).
 - **EXIT TO WINDOWS** (exits to Windows desktop; use the Bantam shortcut icon [circled] to return to AirTrac).
 - **YES** (Windows saving/shutting down advice screen appears, followed by the final 'safe to turn off' message).
- b. After selecting YES, turn off system power when the 'safe to' message appears.

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Top: Saving/shutting down Bottom: Safe to turn off

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Appendix: Antenna Mounting Template

