



TRULINK[®] USER'S MANUAL

CF0056 ADDENDUM

WIRELESS INTERCOM SYSTEM

June 2007

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FCC COMPLIANCE

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

REVISION HISTORY SHEET

REVISION	DESCRIPTION	APPROVAL DATE
--	Original	

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CHAPTER 1 GENERAL

1. INTRODUCTION

This document is intended to be used specifically with the CF0056 configuration. See the TruLink® User's guide for overall information on the TruLink Wireless Communication System. This document will provide specific information for the set up, operation, and check out of the CF0056 configured equipment.

1.1 DEFINITIONS AND ABBREVIATIONS

1.1.1 Definitions of Terms Used

Channel A collection of specific frequencies that define the RF link.

Network A collection of slaves and one MASTER that form the communication group.

Sidetone User's own audio heard in the user's ear.

1.1.2 Abbreviations and Acronyms

NiMH	Nickel Metal Hydride
PTT	Push To Talk button on the TPT
SynVoice	Synthetic Voice (recorded voice message)
TAP	TruLink Access Point Transceiver
DPT	TruLink Dual Port Transceiver
TPT	TruLink Portable Transceiver
VOX	Voice Operated Keying

1.2 TRULINK WIRELESS SYSTEM DESCRIPTION

TruLink is a versatile wireless system that operates in various situations. A TruLink Access Point (TAP) is used in scenarios where a fixed application to the wired ICS is necessary. A Dual Port Transceiver (DPT) is used in scenarios where portable, locatable intercom functionality is needed. A DPT can be, but is not generally used as a hand held unit. The TruLink Portable Transceiver (TPT) is the portable hand held unit in the TruLink Wireless Communication System. The operator wears the

TPT along with a headset that includes headphones and a microphone to communicate with other wireless users and/or the wired ICS. An interface cable (VIP cable) is used as the interface between the DPT and the ICS.

1.3 EQUIPMENT LIST

Table 1.3-1 shows the major components that are supported by this configuration. For a complete list of all the elements needed for a TruLink system, please contact Telephonics Product Support.

**Table 1.3-1
TruLink Equipment List**

NAME	PART NUMBER
TruLink Access Point	780-2000-001-CF0056-M1
TruLink Portable Transceiver	780-1000-001-CF0056-M3
TruLink Dual Port Transceiver	780-1000-003-CF0056-M2
VIP Interface Cable	JB6856-M3

CHAPTER 2

2. TRULINK PORTABLE TRANSCEIVER (TPT)

2.1 OVERVIEW

The TPT is usually set up as a SLAVE in this configuration and is used in conjunction with a TAP or DPT. If no connection to the wired system is necessary, you may use just the TPTs to set up a network. One TPT should be set up as MASTER (see User's Manual) and the other SLAVE TPTs can be turned on and set to the same channel as the MASTER.

2.2 DEFAULT HEADSET SETTINGS

Table 2.2-1 shows the TruLink default headset parameters.

Table 2.2-1
Default Headset Parameters

PARAMETER	SETTING
Default Headset (All User Types)	Gentex HGU 56/P
Sidetone Gain	-6dB
Default Volume at Start Up	Level 4

2.3 TPT OPERATION

When connecting the TruLink system to a wired ICS using either the DPT or TAP, there are three User Types for this configuration.

Based on the User Type selected for that particular TPT, audio is routed to different destinations. This permits TruLink users to have different access to the wired ICS depending on the User Type set for that particular TPT.

Operators can toggle between User Types by:

1. By pressing the 'M' key until "User Type <status>" is heard
2. Toggle User Types by pressing '*' key until the desired User Type is announced
3. Pressing the PTT key to lock in the selection.

2.3.1 User Type 1

User Type 1 is used when there is a desire to separate communication between wireless and wired users.

- VOX initiated audio from the TPT is heard by all TruLink wireless User Types.
- When PTT is pressed on the TruLink TPT, audio is transmitted to
 - The wired ICS users (e.g., pilot, copilot).
 - TruLink users set for User Type 1 and 2 only.
- PTT initiated audio is not heard by User Type 3 TPTs (Type 3 users cannot hear what is being said to the flight crew).
- User Type 1 hears all audio from the wired ICS that is presented at the crew station that the TAP or DPT is connected to.

2.3.2 User Type 2

User Type 2 eliminates the need to press the PTT button on the TPT to be heard by the wired ICS users (e.g., pilot, copilot).

- VOX initiated audio from the TPT is heard by both the ICS and all TruLink User Types
- PTT initiated audio is heard by the wired ICS and TruLink users set for User Types 1 and 2 only.
- PTT initiated audio is not heard by User Type 3 TPTs (Type 3 users cannot hear what is being said to the flight crew).
- The TruLink users hear all wired ICS audio coming from the crew station that the TAP or DPT is connected to.

2.3.3 User Type 3

User Type 3 is used to completely isolate particular TruLink users from the wired ICS communications. Users set for this User Type can pass instructions to the wired users (e.g., pilot, copilot) via other TruLink users that have been set for User Types 1 or 2.

- Audio transmitted by the TPT (VOX or PTT-initiated) is routed only to the TruLink wireless users. No TPT initiated audio is ever routed to the wired system.
- Only VOX initiated audio coming from User Types 1 and 2 can be heard on User Type 3 TPT.
- No audio from the wired ICS can be heard by User Type 3.
- Once User Type 3 is selected, the only way to change to one of the other User Types is to turn the TPT OFF then ON, and it will default back to User Type 1.

CHAPTER 3

3. TRULINK ACCESS POINT

3.1 OVERVIEW

The TAP is used for fixed installations. It is used as the interface to the wired system. The TAP offers three audio ports and one data port (for configuration). The TAP is always used as the MASTER. Any one or all the audio ports can be used to interface to the ICS or to the radios.

3.2 AUDIO CONNECTIONS

There are three audio connectors on the TAP. J1-external 1, J3-external 2, J5-external 3. These can be connected to the wired ICS or to the radios. Generally, the TAP is connected to the headset port of the ICS. All audio ports are active in this configuration. All ports are set for duplex communication.

3.3 TAP OPERATION

A TAP is always operated as a MASTER. However, it requires a TPT SLAVE unit to change the channel. See the TruLink User Manual for details.

CHAPTER 4

4. TRULINK DUAL PORT TRANSCEIVER

4.1 OVERVIEW

The Dual Port Transceiver (DPT) is typically employed for temporary connections to wired intercom systems. It can be easily removed and to a different aircraft. When connected to the wired system, the DPT acts like a TAP and is always the network Master. Generally the DPT is not used as a handheld device but can be if used with the proper headset adapter cable.

When used as an interface to wired intercom systems, the DPT connects to the headset port of the crew station via an application specific interface cable. This is typically a JB6856-M3 for a crew stations that are set up to connect to Gentex flight helmets (HGU/56).

4.2 EXTERNAL AUDIO

The DPT connects to the wired ICS through the VIP interface cable (typically a JB6856-M3).

Unlike the TAP, the DPT has only one active external audio connection.

The output audio level is set to 0 dBm, input level is set to 0dBm. The levels match the needs for connecting to the headset port of a crew station as described previously.

4.3 DPT OPERATION

The DPT is always operated as a MASTER. In order to change the channel a headset adaptor cable is needed. See the Trulink User's Manual for instructions on how to change channels.

4.4 VIP CABLE INTERFACE

The DPT connects to the wired system by the use of an interface cable. Refer to the main TruLink User's Manual for complete the complete echo elimination procedure.

- After ensuring the wired system is operational, plug the VIP cable into the eight-pin Lemo connector on the DPT. With the DPT off, connect the other end into the ICS station.
- Set up the ICS station and turn the DPT power on. A tone and burst of noise should be heard in the wired system. Refer to the user manual for details.
- Turn on the SLAVE TPTs and adjust system if echo is present (see User's Manual for echo elimination procedure) system is now ready for use.

APPENDIX A
UNIT SPECIFICATIONS

TELEPHONICS CORPORATION
COMMUNICATION SYSTEMS DIVISION

LRU ID: TruLink Access Point (TAP)						
LRU CONNECTOR: J1 Audio Interface				Protective Cap PN: 8LTE02B13		
CONNECTOR STD: MIL-C 38999 MS27468T13B35SN				MATING CONN. MS27467T13B35PN		
CONNECTOR MFG'R: SOURIAU				MATING CONNECTOR MFG'R: SOURIAU		
CONNECTOR P/N: 8LT7C13B35SN				MATING CONNECTOR P/N: 8LT5C13B35PN		
Signal Name	Actual Level	Signal Freq	Pin Number	Input/Output	Technical Specs Signal Range	Signal Description
AUDIO_IN- (Note 1)	0 dBm	300 to 3400 Hz	21	Input	Input line impedance (Audio1_IN): 600 Ohm. -46 dBm to +12 dBm	(RX-path) Placing different impedance nets in the connector changes the impedance. The signal is transformer isolated.
AUDIO_IN+			14			
AUDIO_OUT- (Note 1)	+10 dBm	300 to 3400 Hz	16	Output	Output line impedance (Audio1_Out): 600 Ohm -99 dBm to +11 dBm	(TX-path) Placing different impedance nets in the connector changes the impedance. The signal is amplified with a dual operational amplifier. The signal is transformer isolated
AUDIO_OUT+			2			
CTR_DATA_1_OUT-			11	Output	Closed: Max current: 0.14 A Max resistance: 15 Ohm Open: Max voltage: 30 V Max leak current: 0.1 mA	Discrete signal. The signal is isolated by an optocoupler.
CTR_DATA_1_OUT+			12			
CTR_DATA_1_IN-			4	Input	Non detect: Max current: 0.18 mA Max voltage: 0.95 V Detect: Min Current: 0.3 mA Min voltage: 2.2 V	Discrete signal. The signal is isolated by an optocoupler.
CTR_DATA_1_IN+			3			

TELEPHONICS CORPORATION
COMMUNICATION SYSTEMS DIVISION

LRU ID: TruLink Access Point (TAP)						
LRU CONNECTOR: J2 Data Interface				Protective Cap P/N: 8LTE02B09		
CONNECTOR STD: MIL-C 38999 MS27468T09B35SN				MATING CONN. MS27467T09B35PN		
CONNECTOR MFG'R: SOURIAU				MATING CONNECTOR MFG'R: SOURIAU		
CONNECTOR P/N: 8LT7C09B35SN				MATING CONNECTOR P/N: 8LT5C09B35PN		
Signal Name	Signal Level	Signal Freq	Pin Number	Input/ Output	Technical Specs	Signal Description
RX	RS232	Max 115.2 kbit/s	4	Input/ Output	VT100 or ANSI compatible. ASCII transfer protocol. 8 bit data, 1 stop bit, No parity, 38400 baud.	Asynchronous data interface . This interface consists of two RS232 lines. The RS232 transceiver is a SP3232EEA from SIPEX..
TX			6			
GND			1			

TELEPHONICS CORPORATION
COMMUNICATION SYSTEMS DIVISION

LRU ID: TruLink Access Point (TAP)						
LRU CONNECTOR: J3 Audio Interface						
CONNECTOR STD: MIL- MIL-C 38999 MS27468T13B35SA				MATING CONN. MS27467T13B35PA		
CONNECTOR MFG'R: SOURIAU				MATING CONNECTOR MFG'R: SOURIAU		
CONNECTOR P/N: 8LT7C13B35SA				MATING CONNECTOR P/N: 8LT5C13B35PA		
Signal Name	Actual Level	Signal Freq	Pin Number	Input/ Output	Technical Specs Signal Range	Signal Description
AUDIO_IN- (Note 1)	0 dBm	300 to 3400 Hz	21	Input	Input line impedance (Audio1_IN): 600 Ohm. -77 dBm to -2 dBm	(RX-path) Placing different impedance nets in the connector changes the impedance. The signal is transformer isolated.
AUDIO_IN+			14			
AUDIO_OUT- (Note 1)	0 dBm	300 to 3400 Hz	16	Output	Output line impedance (Audio1_Out): 600 Ohm -99 dBm to +11 dBm	(TX-path) Placing different impedance nets in the connector changes the impedance. The signal is amplified with a dual operational amplifier. The signal is transformer isolated
AUDIO_OUT+			2			
CTR_DATA_1_OUT-			11	Output	Closed: Max current: 0.14 A Max resistance: 15 Ohm Open: Max voltage: 30 V Max leak current: 0.1 mA.	Discrete signal. The signal is isolated by an optocoupler.
CTR_DATA_1_OUT+			12			
CTR_DATA_1_IN-			4	Input	Non detect: Max current: 0.18 mA Max voltage: 0.95 V Detect: Min Current: 0.3 mA Min voltage: 2.2 V	Discrete signal. The signal is isolated by an optocoupler.
CTR_DATA_1_IN+			3			

LRU ID: TruLink Access Point (TAP)						
LRU CONNECTOR: J5 Audio Interface				Protective Cap PN: 8LTE02B13		
CONNECTOR STD: MIL--C 38999 MS27468T13B35SB				MATING CONN. MS27467T13B35PB		
CONNECTOR MFG'R: SOURIAU				MATING CONNECTOR MFG'R: SOURIAU		
CONNECTOR P/N: 8LT7C13B35SB				MATING CONNECTOR P/N: 8LT5C13B35PB		
Signal Name	Actual Level	Signal Freq	Pin Number	Input/Output	Technical Specs Signal Range	Signal Description
AUDIO_IN- (Note 1)	0 dBm	300 to 3400 Hz	21	Input	Input line impedance (Audio1_IN): 600 Ohm. -46dBm to +10 dBm	(RX-path) Placing different impedance nets in the connector changes the impedance. The signal is transformer isolated.
AUDIO_IN+			14			
AUDIO_OUT- (Note 1)	-10 dBm	300 to 3400 Hz	16	Output	Output line impedance (Audio1_Out): 600 Ohm -99 dBm to +11 dBm	(TX-path) Placing different impedance nets in the connector changes the impedance. The signal is amplified with a dual operational amplifier. The signal is transformer isolated
AUDIO_OUT+			2			
CTR_DATA_1_OUT-			11	Output	Closed: Max current: 0.14 A Max resistance: 15 Ohm Open: Max voltage: 30 V Max leak current: 0.1 mA.	Discrete signal. The signal is isolated by an optocoupler.
CTR_DATA_1_OUT+			12			
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CTR_DATA_1_IN+			3			