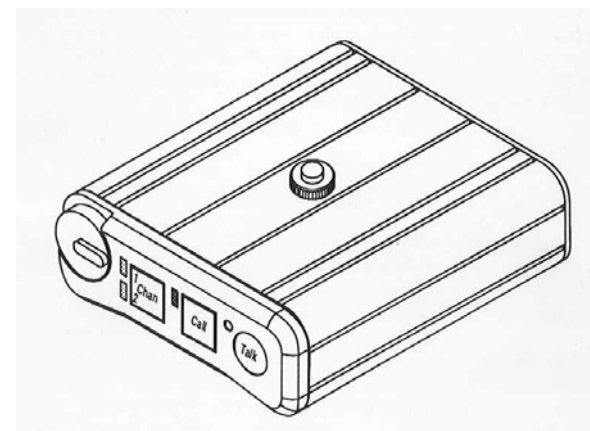


## Operating Instructions



## NFL-2002 Beltpacks

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Warranty Notice

See enclosed warranty card for further details.

Customer Support

Technical questions should be directed to:

Customer Service Department  
RTS/Telex Communications, Inc.  
12000 Portland Avenue South  
Burnsville, MN 55337 USA  
Telephone: 800-392-3497  
Fax: 800-323-0498  
Factory Service: 800-553-5992

Return Shipping Instructions

Customer Service Department  
Telex Communications, Inc. (Lincoln, NE)  
Telephone: 402-467-5321  
Fax: 402-467-3279  
Factory Service: 800-553-5992

Please include a note in the box which supplies the company name, address, phone number, a person to contact regarding the repair, the type and quantity of equipment, a description of the problem and the serial number (s).

Shipping to the Manufacturer

All shipments of product should be made via UPS Ground, prepaid (you may request from Factory Service a different shipment method). Any shipment upgrades will be paid by the customer. The equipment should be shipped in the original packing carton. If the original carton is not available, use any suitable container that is rigid and of adequate size. If a substitute container is used, the equipment should be wrapped in paper and surrounded with at least four (4) inches of excelsior or similar shock-absorbing material. All shipments must be sent

to the following address and must include the Proof of Purchase for warranty repair. Upon completion of any repair, the equipment will be returned via United Parcel Service or specified shipper, collect.

Factory Service Department  
Telex Communications, Inc.  
8601 Cornhusker Hwy.  
Lincoln, NE 68507 U.S.A.  
Attn: Service

This package should include the following:

| QTY | Description             | PartNo.       |
|-----|-------------------------|---------------|
| 1   | NFL-2002 Final Assembly | 9010-7710-000 |
| 1   | Operation Manual        | 9350-7775-000 |
| 1   | Warranty Card           | 38110-390     |
| 1   | NFL Beltpack Cord       | 5500887-000   |

FCC STATEMENT

This equipment uses, and can radiate radio frequency energy that may cause interference to radio communications if not installed in accordance with this manual. The equipment has been tested and found to comply with the limits of a Class A computing device pursuant to Subpart B, Part 15 of FCC Rules which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference which the user (at his own expense) will be required to correct.

**Audiocom® is a registered trademark of Telex Communications, Inc., Burnsville, Minnesota 55337**

**Clear-Com® is a registered trademark of Clear-Com Intercom Systems**

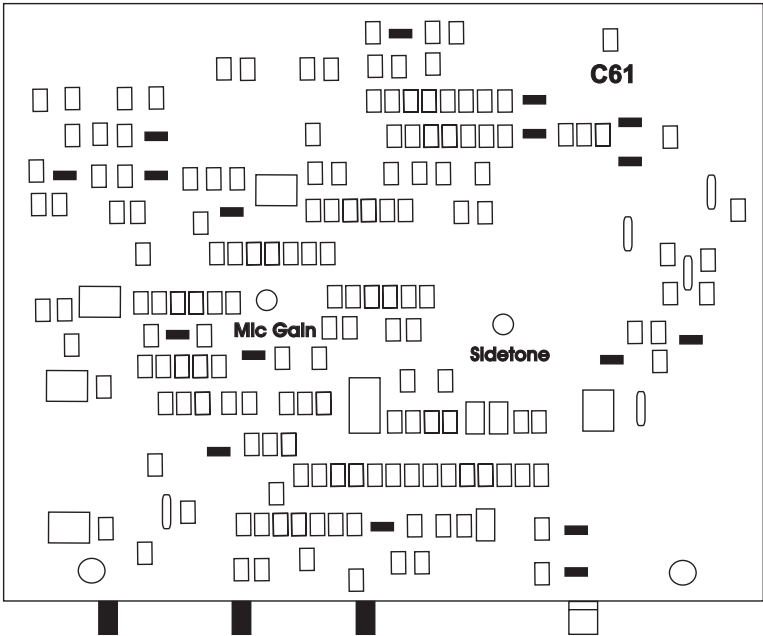


Figure 3. Printed Circuit Board

| Jumper/Switch Number                                                              | Jumper or Switch Function                                                  | Default Setting    |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------------|
| JP1 & JP2<br><br><small>NOTE: JP1 and JP2 need to be in the same position</small> | Power Select                                                               | Pins 2 & 3 shorted |
|                                                                                   | Channel One Power: Pins 2&3 shorted<br>Channel Two Power: Pins 1&2 shorted |                    |
| SW1                                                                               | Clear-Com / Audiocom® Operation                                            | BAL                |
|                                                                                   | Unbalanced / Balanced Line                                                 |                    |
| JP3                                                                               | Must be left on default                                                    | Pins 2 & 3 shorted |

Table 2. Internal Switches and Jumpers

## APPENDIX A

### OPTIONAL FOOTBALL MODIFICATIONS

#### GENERAL DESCRIPTION

In Audiocom® Intercom Systems, the Mic-Kill feature is used to turn off any activated microphones on a selected channel. The Mic-Kill feature is activated when the beltpack receives a 24 kHz signal from the channel. In some applications the Mic-Kill and Call signal features are not desired and need to be disabled.

#### ELIMINATING MIC-KILL AND CALL SIGNAL

**CAUTION:** TO PREVENT DAMAGE TO THE EQUIPMENT, THESE MODIFICATIONS SHOULD ONLY BE MADE BY QUALIFIED TECHNICIANS.

If desired, the Mic-Kill and Call signal features can be disabled in the NFL-2002 by removing a surface-mounted capacitor from the printed circuit board. Perform the following:

1. Before making changes to the printed circuit board, disconnect all power and line connections from the beltpack.
2. Refer to Figure 3 and locate C61 on the underside of the printed circuit board.
3. Remove capacitor C61 from the printed circuit board.

#### RESTORING MIC-KILL AND CALL SIGNAL

To restore the Mic-Kill and Call signal features, replace C61 with Telex® part number 102881-140, 1500 pF, 50V capacitor.

## Introduction

The Audiocom®<sup>1</sup> NFL-2002 is a microprocessor controlled two-channel intercom beltpack. An internal switch and jumper setting allows the unit to be used with Clear-Com®<sup>2</sup> components, if desired. Other internal switch and jumper settings allow the unit to be uniquely configured to the operator's requirements.

## OPERATION

### SYSTEM POWER

The NFL-2002 beltpack receives power externally in one of two ways:

- The intercom channel
- The local-power (pin 2) of the intercom channel connector

### INITIAL NFL-2002 SETUP

The channel termination is initially set for balanced operation, which is compatible with other Audiocom® equipment. If the unit is going to be connected to Clear-Com equipment, one switch must be changed as described on page 11.

The headset is auto-sensing which means the unit automatically determines if an Electret or Dynamic headset is attached to the unit.

1. Audiocom® is a registered trademark of Telex Communications, Incl., Burnsville, MN 55337  
2. Clear-Com® is a registered trademark of Clear-Com Intercom Systems.

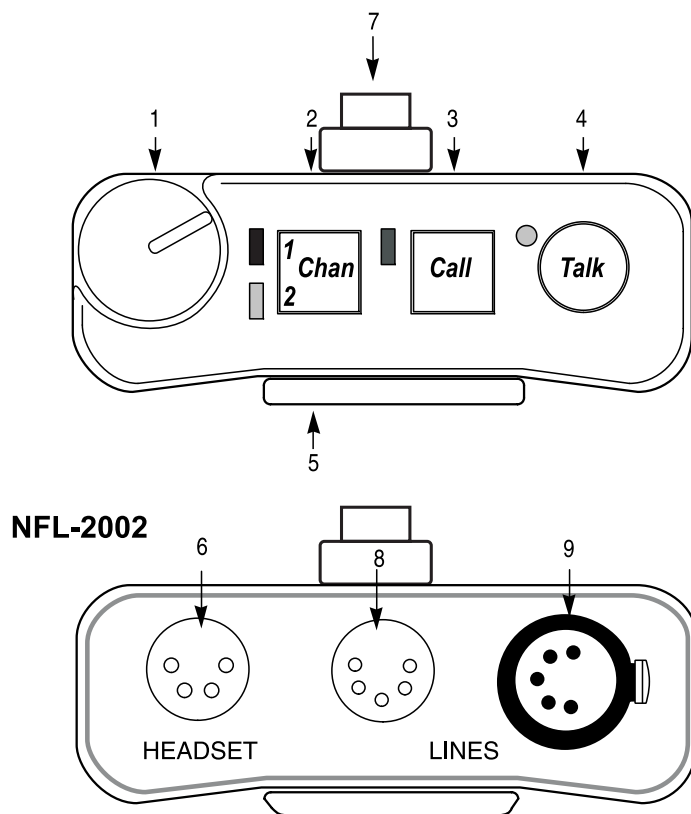


Figure 1. NFL-2002 Connections and Controls

## SPECIFICATIONS

### GENERAL:

#### Power Requirements:

Channel supplied: 24 VDC nominal, 40 to 100 mA

Local-power: 24 VDC nominal (21 to 30 VDC), 40 to 100 mA

#### Environmental Requirements:

Storage: -20°C to 80°C; 0% to 95% humidity, non-condensing

Operating: -15°C to 60°C; 0% to 95% humidity, non-condensing

Dimensions: 5.0" (127 mm) H x 3.5" (88.9 mm) W x 1.8" (45.7 mm) D

Weight: 1.5 pounds (0.68 kg)

### INTERFACE REQUIREMENTS:

#### Headset:

1000 - 3000 ohm electret microphone

50 - 200 ohm dynamic microphone

150 to 600 ohm headphones

#### Input Level:

4 mVRMS (nominal)

#### Balanced Intercom Channel:

Output Level: 1 VRMS nominal

Terminating Impedance: 300 ohm  $\pm 5\%$

Bridging Impedance: greater than 10,000 ohm

Call Signalling:

Send: 20 kHz  $\pm 100$  Hz, 500 mVRMS  $\pm 10\%$

Receive: 20 kHz  $\pm 800$  Hz, 100 mVRMS

Mic-Off Frequency:

Detect: 24 kHz  $\pm 800$  Hz, 100 mVRMS

Noise Contribution: less than -60 dBu on the line

Total Harmonic Distortion: less than 1% at channel output for normal input

#### Unbalanced Intercom Channel:

Output Level: 775mVRMS  $\pm 10\%$

Terminating Impedance: 200 ohm  $\pm 5\%$

Bridging Impedance: greater than 10,000 ohm

Call Signalling:

Send: 12  $\pm 3$  VDC on the line

Receive: 4 - 15 VDC from the line

Total Harmonic Distortion: less than 1% at channel output for normal input

### HEADPHONE AMPLIFIER:

Maximum Output:

4.5  $\pm 10\%$  VRMS into 150 $\Omega$  headset

Frequency Response:

200 Hz to 8 kHz  $\pm 2$  dB

Audible Alert:

1 kHz, at the headset

Total Harmonic Distortion:

Less than 1% at less than 3.5 VRMS into 150 $\Omega$  headset

Sidetone:

20  $\pm 3$  dB minimum range, adjustable

## Side Tone Adjustment (R145)

The side tone adjustment is accessible either internally (refer to Figure 2) or by removing the belt clip mounting screw (callout 5 in Figure 1).

To adjust the level of your own voice heard in the headphones, tap the Talk button once to turn on the headset microphone. Then, use a small flat-blade screwdriver to increase or decrease your voice level while talking into the microphone.

## Mic Gain Adjustment (R156)

The Mic Gain adjustment is accessible internally on the board (R156), see Figure 2.

To adjust Mic Gain, do the following:

Using a Phillips head screw driver, turn the Mic Gain pot clockwise to increase the gain (or counter-clockwise to decrease the gain).

## Clear-Com Setup

Make the following switch and jumper changes when the beltpack is used with Clear-Com equipment:

### NFL-2002

1. SW1 must be placed in the UNBAL position.

## CONNECTOR PIN CONFIGURATIONS

### Headset Connector

Type: XLR-4M (callout 6 in Figure 1)

|       |                         |
|-------|-------------------------|
| Pin 1 | Headset microphone low  |
| Pin 2 | Headset microphone high |
| Pin 3 | Headphone high          |
| Pin 4 | Headphone low           |

### Intercom Channel Connectors

#### NFL-2002

Type: One XLR-5M (callout 8 in Figure 1)

Audiocom® Mode (Internal switch SW1 and set to BAL position)

|       |                                                 |
|-------|-------------------------------------------------|
| Pin 1 | Common                                          |
| Pin 2 | Local power (21-30 VDC)                         |
| Pin 3 | Channel A intercom audio low and +24 VDC input  |
| Pin 4 | Channel A intercom audio high and +24 VDC input |
| Pin 5 | Channel B intercom audio low and +24 VDC input  |
| Pin 6 | Channel B intercom audio high and +24 VDC input |

**Clear-Com Mode** (Internal switch SW1 and jumpers set to UNBAL position)

|       |                                      |
|-------|--------------------------------------|
| Pin 1 | Common                               |
| Pin 2 | Local power (21 to 30 VDC)           |
| Pin 3 | Channel A +30 VDC input              |
| Pin 4 | Channel A intercom audio/call signal |
| Pin 5 | Channel B +30 VDC input              |
| Pin 6 | Channel B intercom audio/call signal |

## EXTERNAL CONNECTIONS & CONTROLS

**NOTE:** The numbers refer to the callouts in Figure 1.

1. **VOLUME CONTROL:** Use this control to adjust the headset listen level.
2. **CHAN BUTTON AND INDICATORS:** The Chan button allows the user to select which intercom channel is active. Press the Chan button to change the channel selection. The yellow indicator next to the channel number lights to show the active channel.
3. **CALL BUTTON AND INDICATOR:** The Call function allows the user to send or receive signals to other devices on the intercom channel selected. The Call button operates in two ways:

*Call receive:* When there is an incoming call signal, the indicator is red. (If Audible Call Alert is enabled, incoming calls will cause beeps in the headset.) On the NFL-2002, calls can be received on the selected channel only.

*Call send:* To send a call signal to all stations on a channel, press and hold the Call button until a verbal response is received. The indicator will glow red. On the NFL-2002, calls can be sent on the selected channel only.

4. **TALK BUTTON AND INDICATOR:** The Talk button activates the headset microphone and operates in two ways:  
**Latched Mode:**  
Tap the button once to talk. The indicator will glow green. Tap the button again when finished with a conversation.  
**Momentary Mode:**  
Press and hold the button to talk momentarily. Release the button when finished talking.

**NOTE:** If no headset is connected when the Talk button is pressed, the Talk button will have the same function as the Chan button.

5. **SIDETONE CONTROL:** When using a headset, this control adjusts your own voice level heard in the headphones. To adjust the level, tap the Talk button once to turn on the headset microphone. Then, use a small flat-blade screwdriver to increase or decrease your voice level while talking into the microphone. (This control is accessible by removing one screw of belt clip.)
6. **HEADSET CONNECTOR:** This connector accepts a four wire Telex® boom-microphone headset.

7. **RADIO PUSH-TO-TALK BUTTON:** If the Motorola GP-300 radio is connected to the beltpack, press the PTT to transmit via the radio. (After pressing PTT, wait for the tone to stop.)

**Note:** If the Talk button is in Latched Mode, pressing PTT will simultaneously transmit your voice via the radio and Intercom system.

8. **RADIO CONNECTOR:** This connector accepts the five-pin cable supplied to connect the belt pack to the GP-300 radio.
9. **INTERCOM CHANNEL CONNECTORS:** Intercom channels are connected via a 6-pin connectors (one male and one female).

#### Local Power Input

Normally the NFL-2002 is powered from the intercom system and will turn on with the intercom system. The NFL-2002 belt pack may also be powered from an optional power supply (21-30 VDC; 100 mA) connected between pin 2 (+) and pin 1 (-) of the intercom channel connector.

## OPERATING MODES

The microprocessor within the NFL-2002 controls four modes of operation that affect the Microphone Kill and Audible Call Alert features (as shown in Table 1).

| MODE<br>(BEEPS) | MIC KILL | AUDIBLE<br>CALL ALERT |
|-----------------|----------|-----------------------|
| 1               | Disabled | Disabled              |
| 2 (Default)     | Enabled  | Disabled              |
| 3               | Disabled | Enabled               |
| 4               | Enabled  | Enabled               |

Table 1. Operating Modes

## Changing Modes of Operation:

Perform the following steps to change the mode of operation.

1. Both the Talk and Call indicators should be OFF and the headset should be connected.
2. Press and hold the Talk key, then press and hold the Call key, then release both keys. The Call indicator should now glow red. (The number of beeps heard in the headset indicates the current mode of operation.)
3. Press the Call key to change to the next mode of operation. Each press of the Call key will cause the NFL-2002 to change to the next mode of operation.
4. When the desired mode is reached, press the Talk key to select that mode and exit the mode changing function. (Beeps will be heard in the headset when the mode changing function is exited. The number of beeps heard indicates the selected mode of operation.)

**NOTE:** Each time the intercom system power is turned on, the beltpack will reset to the default mode of operation (Mode 2).

## Internal Switches, Jumpers and Adjustments

There are several internal switches, jumpers, and adjustments that affect operation. These are described below. To gain access to the switches, jumpers and the adjustments, disconnect all headsets, power and line connections. Remove two screws from the top of each side and two screws from the bottom of each side. Switch, jumper and adjustment locations are shown in Figure 2.

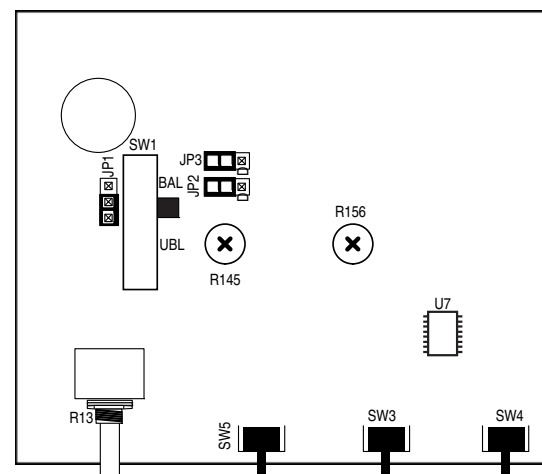


Figure 2. Internal Switches, Jumpers and Adjustments