

## Introduction

Phone patch operation allows linking your FT-1000MP to the public telephone line to provide two-way simplex communications on behalf of third parties. The FT-1000MP may be used with the LL-7 phone patch unit installed in the optional SP-8 external loudspeaker, or with phone patch units from other manufacturers. The diagram on page 3 shows interconnections for the SP-8/LL-7 combination with the FT-1000MP; be sure to consult the documentation provided with units of other manufacture for installation instructions.

## LL-7 Installation

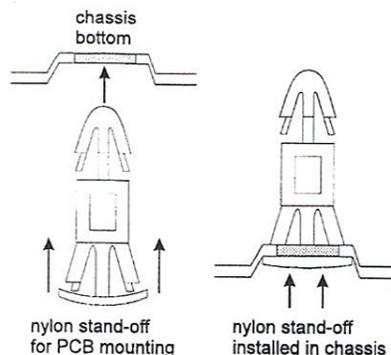
The LL-7 Phone Patch Unit can be purchased separately and installed in the SP-8. If you purchased the SP-8 with the LL-7 already installed, skip ahead to "Interconnections" and "Operation". Otherwise, your LL-7 package should include the following supplied components:

<u>ITEM</u>	<u>QTY.</u>
PATCH UNIT	1
VR UNIT	1
Nylon PCB Mounting Stand-Offs	4
Nylon Rivets	2
Audio Cable (RCA plug)	1
Transceiver Interface Cable	1
Telephone Line Plug	1

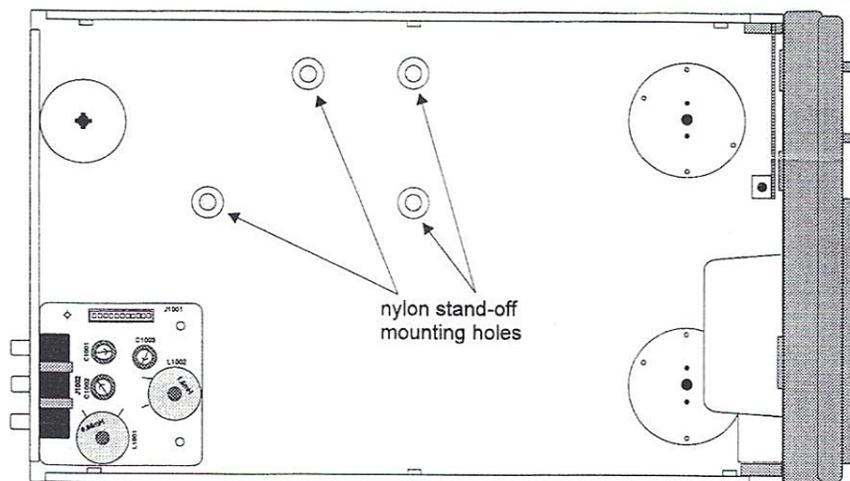
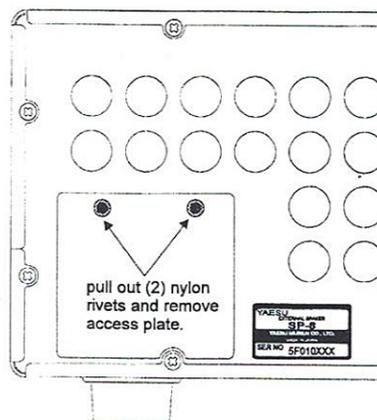
The LL-7 consists of two subassemblies; the PATCH UNIT and VR-UNIT. The PATCH UNIT contains the rear-panel telephone line and transceiver connections, while the VR UNIT mounts the front-panel meter, and **TX GAIN/RX GAIN** controls. To install the LL-7, complete the following steps.

## Installing the PATCH UNIT

- Remove the (10) top cover screws of the SP-8. Slide the cover back, and remove it. Note the four holes on the bottom of the chassis. Install a nylon PCB mounting stand-off in each hole by inserting it in from the underside of the chassis and pressing it up into place. These will be used to mount the PATCH UNIT circuit board later.

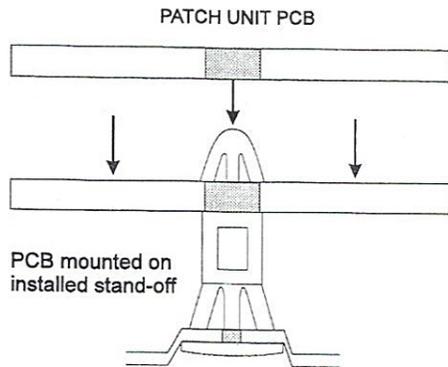


- On the lower left corner of the rear panel, locate the sheet metal access cover over the rectangular cut-out. Pull out on each nylon rivet fastener, and remove this cover.



SP-8 Chassis (top view)

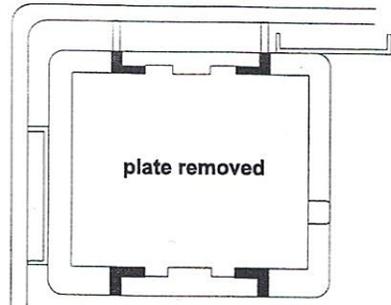
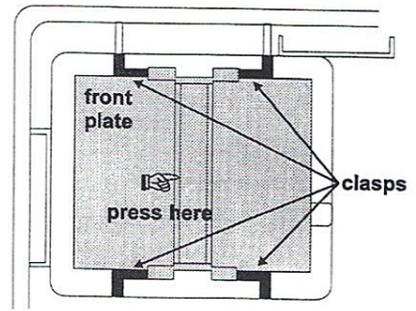
- Insert the LL-7 PATCH UNIT in through the rear access opening, and position it so that its four PCB mounting holes align with the four nylon stand-offs on the bottom of the SP-8 case.
- Press the PATCH UNIT board down into place, so that the tips of each nylon stand-off “mushroom” out and lock the PCB in place.



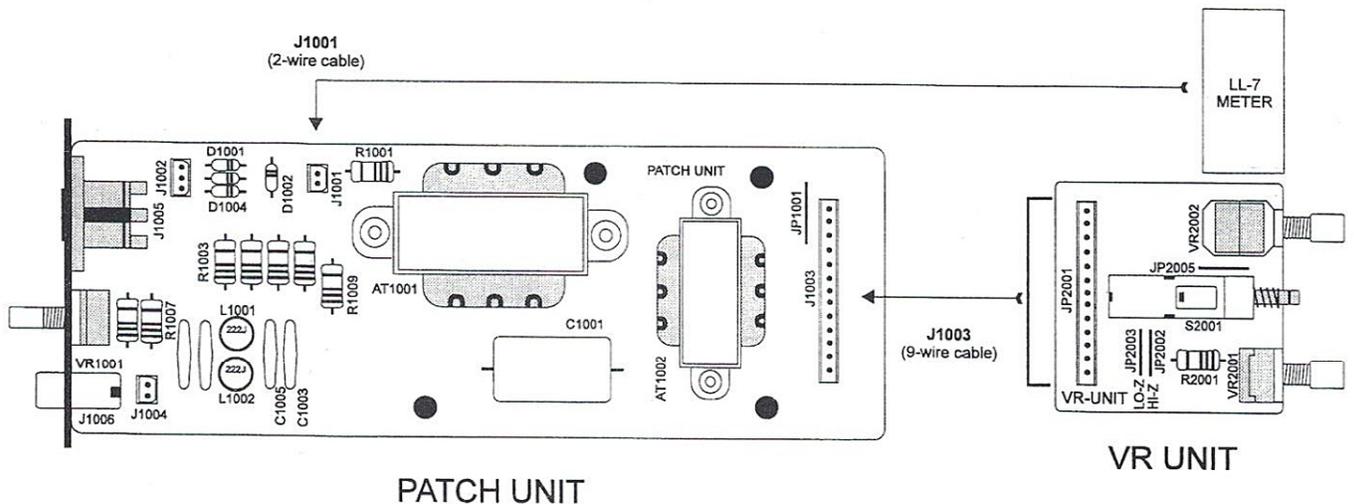
- Affix the connector plate of the PATCH UNIT to the rear panel of the SP-8 by inserting one of the supplied nylon rivets in each mounting hole and pressing it into place.

### Installing the VR UNIT

- Locate the locking tabs behind the frequency response plate. Using your thumb or two fingers, press on the center of the installed plate so the locking clasps spread, then push the plate out from behind. This plastic plate is not used when the LL-7 is installed, but you may wish to keep it for later reference to the chart.



- Insert the VR UNIT PCB (wiring first) into the front panel opening, then press it into place so that the locking tabs in the rear secure it firmly.
- Insert the 14-pin plug into J1003 on the PATCH UNIT, and the 2-pin plug from the meter into J1001 (see drawing at page bottom).
- Replace the top cover and its 10 screws (put the two long screws in the front edge of the cover).



## Interconnections

- ❑ First locate the supplied short cable with RCA phono plug connectors on both ends. Connect this cable between the **SP** jack of the LL-7, and the **INPUT A** or **B** jack of the SP-8.
- ❑ Next locate the supplied cable with a 6-pin DIN plug on one end, and dual audio plugs on the other. Connect this cable from the **RADIO** jack on the LL-7, to the **PATCH** and **EXT SPKR** jacks on the transceiver (the drawing below depicts the FT-1000MP - your transceiver may vary).
- ❑ Connect the two-wire **LINE** jack on the LL-7 to your telephone system last.

## Operation

Phone patch Tx/Rx switching may be done manually using the PTT method, or automatically using the VOX circuit of the transceiver. While the PTT method does not require balancing the bridge circuit in the LL-7, it does require more work by the operator: switching the microphone PTT or transceiver **MOX** button at each "over" during patched conversations.

Therefore, most operators prefer to use the VOX method whenever the telephone signal-to-noise level permits. If the telephone noise level is high, however, the PTT method may still be necessary, so you should become familiar with both methods.

Regardless of which patch control method is used, you may need to instruct the person on the telephone to speak slowly at a clear normal voice, and to say "over" and then keep quiet when they expect a response from the other radio station. This serves as a notice to you (if you are using

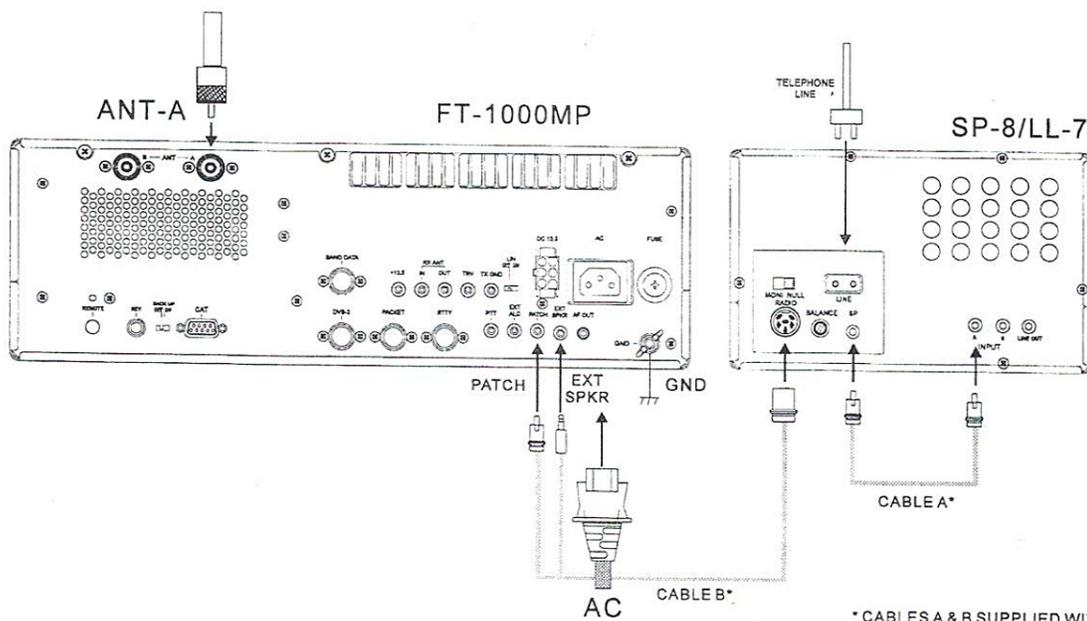
PTT control) to switch to receive while signaling the other station to go ahead and transmit, and will help avoid "doubling" with the other station.

During all phone patch operation you should *monitor both sides of the conversation at all times* (this may be required by law). This requires a telephone at the operating position.

### Manual (PTT) Patch Control

- ❑ With the transceiver carefully tuned to the station for whom the patch is being made, preset the **VOX GAIN**, **DELAY**, and **MIC GAIN** controls all fully *counter-clockwise* (minimum). Also set the transceiver's meter to indicate ALC. On the LL-7, preset the **RX GAIN** and **TX GAIN** to their 12 o'clock positions.
- ❑ Bring the telephone party on the line, and after instructing them about patch operation (saying "over"), ask them to please stand by.
- ❑ Press the **PATCH** push-button on the LL-7 to turn it on, and if necessary, set the volume control on the transceiver to about the 10 o'clock position (or wherever you usually have it set). Now adjust the LL-7's **RX GAIN** control for comfortable volume *in the telephone receiver*.
- ❑ Press the PTT or **MOX** switch, and speak into the telephone. While watching the ALC indication on the transceiver's meter, advance the **MIC GAIN** control on the transceiver for a normal ALC level.
- ❑ While still keying the transmitter, tell the person on the telephone to speak (to the other station, over the air), and adjust the **MIC GAIN** slightly, if necessary, for proper ALC.

**Remember to switch back to receive when they say "over"!**

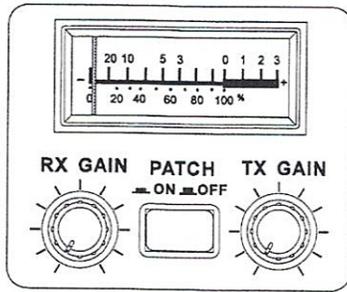


\* CABLES A & B SUPPLIED WITH LL-7 UNIT

### Null Alignment for VOX Operation

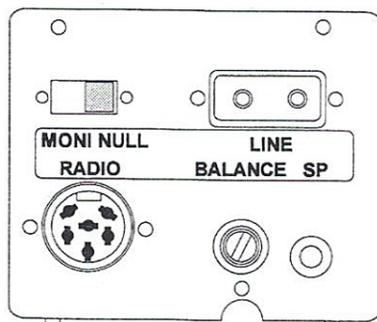
If automatic VOX patch control is to be used, this procedure must be performed at least once when the transceiver and LL-7 are first connected. Later, fine adjustments can be made during patch operation to compensate for slight variations in the telephone line.

- ❑ Preset the **RX GAIN** and **TX GAIN** controls on the LL-7 fully *clockwise*, and set the **MONI/NULL** switch on the rear panel of the LL-7 to **NULL**.



LL-7 Front Panel Controls

- ❑ Tune the transceiver to WWV (or turn on the transceiver's heterodyne marker if so equipped), and tune for a strong heterodyne of about 1 kHz.
- ❑ Preset the transceiver's **VOX GAIN** control fully counter-clockwise, and lift the telephone handset from the cradle.
- ❑ Press the **PATCH** button on the front of the LL-7 (—), and turn the receiver volume control on the transceiver fully *clockwise* (maximum).
- ❑ Adjust the **BALANCE** control on the rear of the LL-7 to obtain maximum (null) deflection on the LL-7's meter.



LL-7 Rear Panel  
Controls & Connectors

- ❑ Tune off-frequency, or switch the transceiver's marker off, and reduce the volume control to normal, or about the 10 o'clock position. Return the **MONI/NULL** switch on the rear of the LL-7 to **MONI**. The LL-7 is now ready for VOX patch control.

### Automatic (VOX) Patch Control

Before using the VOX control for the first time, perform the *Null Alignment* procedure just described, to match your transceiver's audio output to the phone line.

- ❑ Set up the transceiver for regular VOX operation in LSB or USB mode as described in the transceiver's operating manual.
- ❑ When ready to make a phone patch, follow the same procedure as described previously for Manual (PTT) Patch Control, except when you instruct the person on the telephone to start talking, instead of pressing the **PTT** or **MOX** switch, advance the **VOX GAIN** control on the transceiver just to the point where their voice keys the transmitter.
- ❑ Now adjust the transceiver's **DELAY** control for stable transmission and return to reception when they stop speaking.
- ❑ If necessary, adjust the transceiver's **A-VOX** control to prevent receiver audio from keying the VOX (and the transmitter) when the person on the telephone is not speaking.
- ❑ If you have difficulty setting the **VOX GAIN** and **A-VOX** controls for smooth operation, move the **MONI/NULL** switch on the rear of the LL-7 to the **NULL** position, and adjust the **BALANCE** control (also on the rear of the LL-7) slightly for minimum meter deflection while receiving the signal over the air. If instability persists, try reducing the transceiver's volume slightly.

#### YAESU MUSEN CO., LTD.

1-20-2 Shimomaruko, Ota-Ku, Tokyo 146-8649, Japan

#### YAESU U.S.A.

17210 Edwards Rd., Cerritos, CA 90703, U.S.A.

#### YAESU EUROPE B.V.

P.O. Box 75525 1118 ZN, Schiphol, The Netherlands

#### YAESU UK LTD.

Unit 12, Sun Valley Business Park, Winnall Close  
Winchester, Hampshire, SO23 0LB, U.K.

#### YAESU GERMANY GmbH

Am Kronberger Hang 2, D-65824 Schwalbach, Germany

#### YAESU HK LTD.

11th Floor Tsim Sha Tsui Centre, 66 Mody Rd.,  
Tsim Sha Tsui East, Kowloon, Hong Kong



