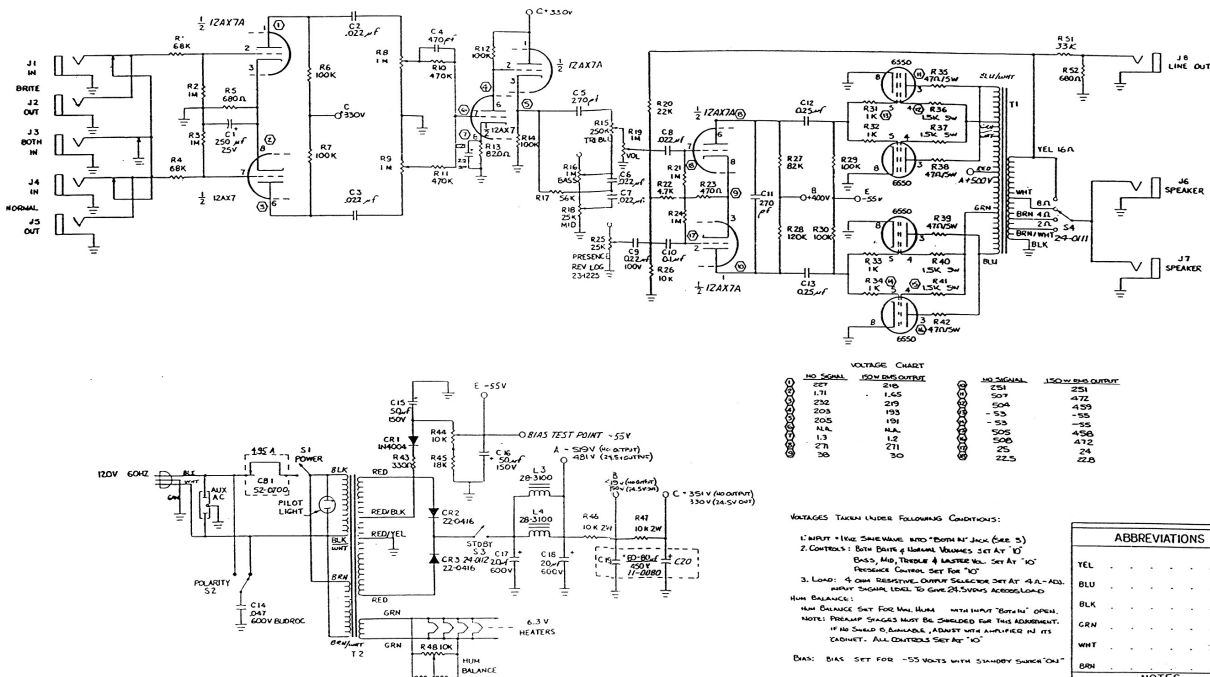
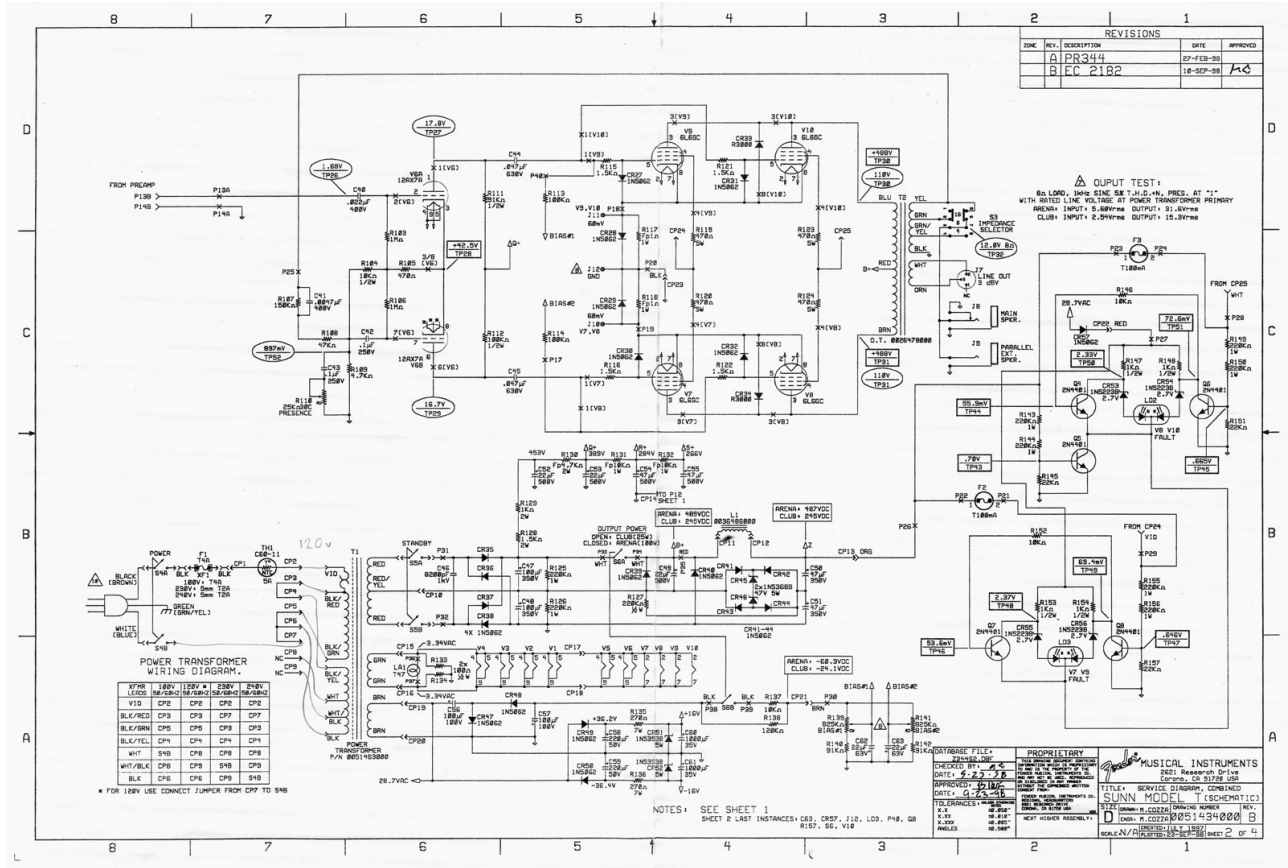
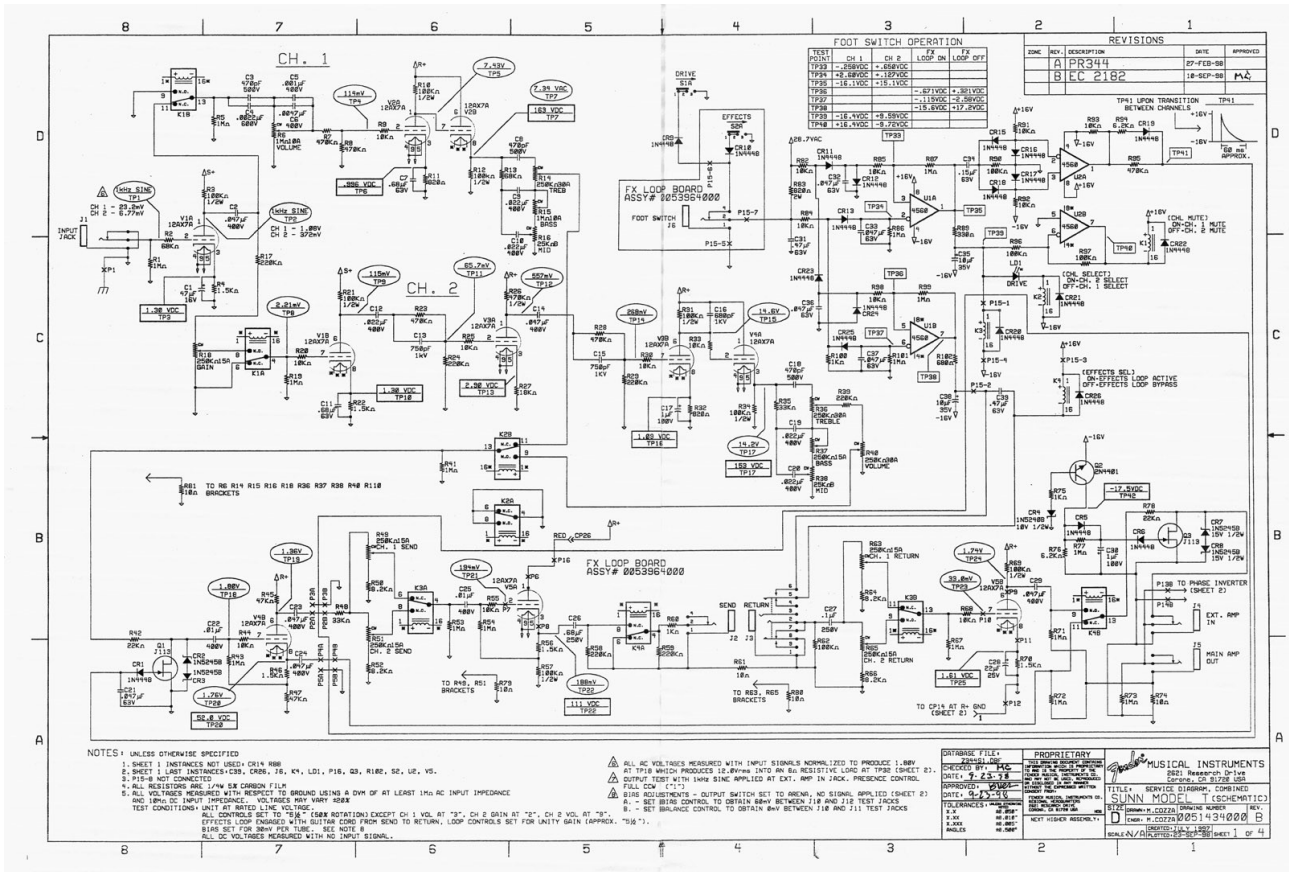


# SUNN 60S 70S model T





## Front Panel

Brite and normal channels, 1 input/channel, 1 output/channel, 1 combined-channel input, 1 volume control/channel, master volume, bass, midrange, treble, presence, power switch, stand-by switch

## Rear Panel

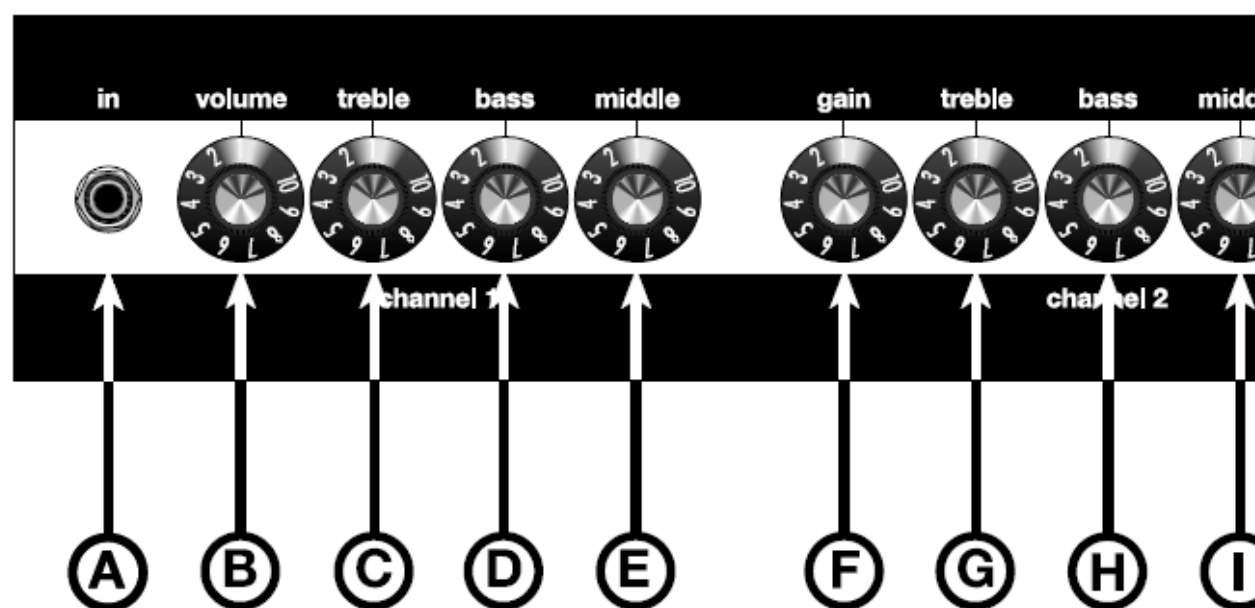
AC outlet, circuit breaker, polarity switch, 600 ohm line out jack, 2 speaker jacks, impedance selector switch: 2, 4, 8, 16 ohms.

## Power

150 watts RMS (170 watts at distortion level)



## MODEL T FRONT PANEL FUNCTIONS

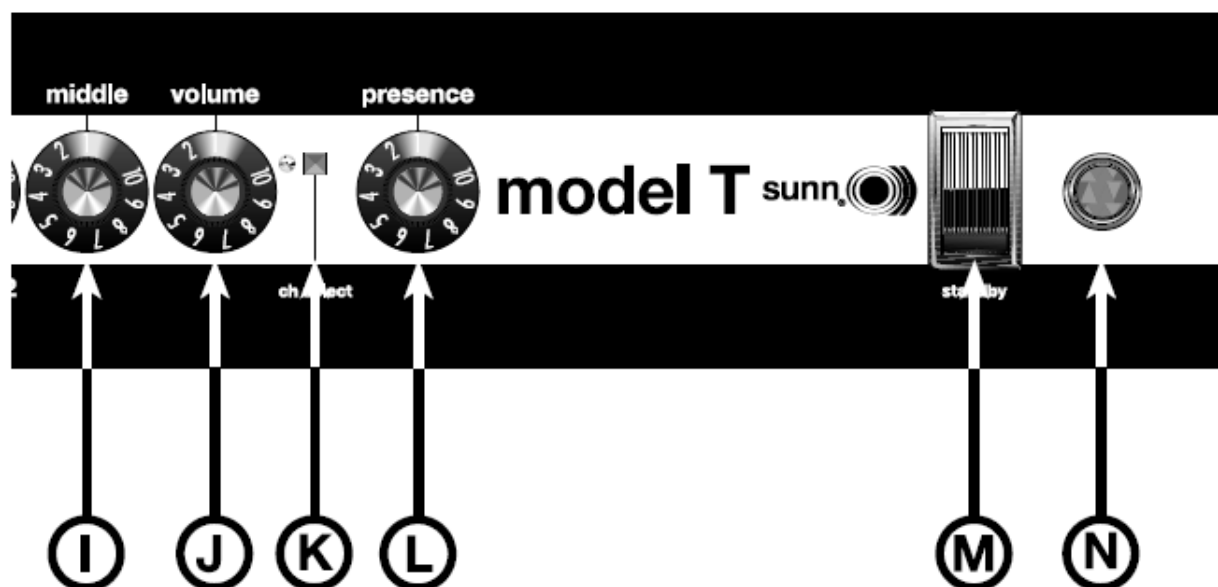


**A. IN** - Plug your guitar in here.

**B. VOLUME** - Adjusts the volume level of Channel 1.

**G. TREBLE** - Adjusts the amount of increase or decrease in the high frequency content of Channel 2.

**H. BASS** - Adjusts the amount of increase or



**K. CHANNEL SELECT LED** - This LED Does Not illuminate when Channel 1 is active. When this LED illuminates RED, Channel 2 is active. **CH SELECT**- This push-push button switches between Channel 1 and Channel 2. When this button is in, Channel 2 is active. Using the footswitch (included) overrides the channel select switch.

**L. PRESENCE**- Adjusts the high frequency response of the amplifier. Rotating this knob clockwise enhances the upper highs giving the Model T a slightly "crisper" tone.

**M. STANDBY** - When the power switch and this switch are ON, your Model T is ready to perform. In the STANDBY position, power is supplied ONLY to the tube filaments and sound will NOT come out of the amp. Using the STANDBY SWITCH during short breaks eliminates tube warm-up time and will increase tube life.

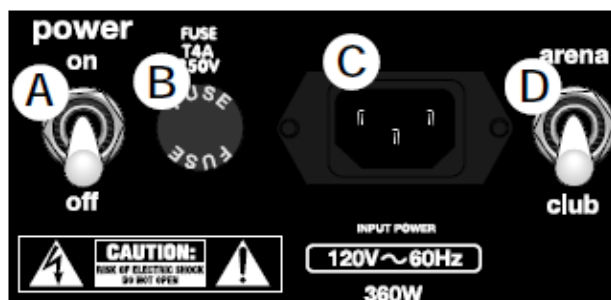
**N. PILOT LIGHT** - This pilot jewel illuminates when the Model T is receiving power. Should this bulb burn out, turn off and unplug the amplifier, unscrew the pilot jewel and replace the lamp with a type T47 bulb.

## MODEL T REAR PANEL FUNCTIONS

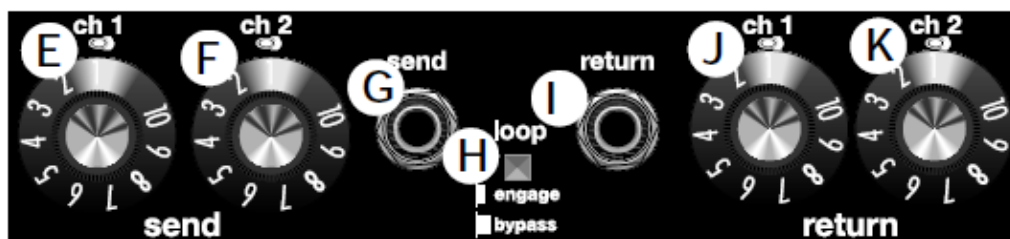
**A. POWER SWITCH** - Turns the AC power ON and OFF. When the switch is in the OFF position, the amplifier is completely shut down.

**B. FUSE** - The fuse is in the AC supply of the amplifier and will help to protect the amplifier in the event of an electrical fault. If a fuse blows, replace it only with one of the same type and rating. (Refer to the specification page to determine the correct fuse type and rating for your amplifier). **NEVER use a fuse with a higher current rating as this could damage the equipment and present a serious safety hazard.** If the amplifier repeatedly blows fuses, it should be taken to an authorized Fender service center.

**C. LINE CORD** - The Model T is equipped with a grounding type IEC supply cord to reduce the possibility of shock hazard. Be sure to connect it to a grounded AC receptacle. **DO NOT ALTER THE AC PLUG.**



**D. ARENA / CLUB** - Switches the output power of your Model T between 100W and 25W operation. When the switch is in the arena position, the amplifier's output is at 100W useful for larger venues. When the switch is in the club position, the amplifier's output is at 25W.



**E. CH.1 SEND** - This knob adjusts the channel 1 send level for the effects loop. Rotating the knob clockwise increases the amount of signal sent to your effects unit.

**F. CH.2 SEND** - This knob adjusts the channel 2 send level for the effects loop. Rotating the knob clockwise increases the amount of signal sent to your effects unit.

**G. SEND** - This 1/4 inch, unbalanced, TS, output jack is designed to send a signal to an external signal processing device, such as a digital delay or a chorus unit.

**H. LOOP** - This push-push button is the On / Off switch for the effects loop circuit. When this button is pressed, the effects loop is engaged and the guitar amp's signal is routed to your effects unit. *Note: Using the footswitch overrides the Loop bypass button.*

**I. RETURN** - This 1/4 inch, unbalanced, TS, input jack is designed to accept signal from an external processing device, such as a digital delay or a chorus unit. The effects loop will not operate without a plug inserted into this jack.

**J. CH.1 RETURN** - This knob adjusts the channel 1 return level for the effects loop. Rotating the knob clockwise increases the amount of signal returned to your Model T amplifier from your effects unit.

**K. CH.2 RETURN** - This knob adjusts the channel 2 return level for the effects loop. Rotating the knob clockwise increases the amount of signal returned to your Model T amplifier from your effects unit.

## EFFECTS LOOP OPERATION INSTRUCTIONS

1. Adjust both channel's front panel controls to the desired volume and tone settings.

2. Turn all effects loop controls on the rear panel to 1.



3. Disconnect the footswitch from the amplifier and place the channel select button on the front panel to the Channel 1 setting (item K, page 5).

4. Place the effects loop button located on the rear panel (item H, page 6) in the Bypass position.

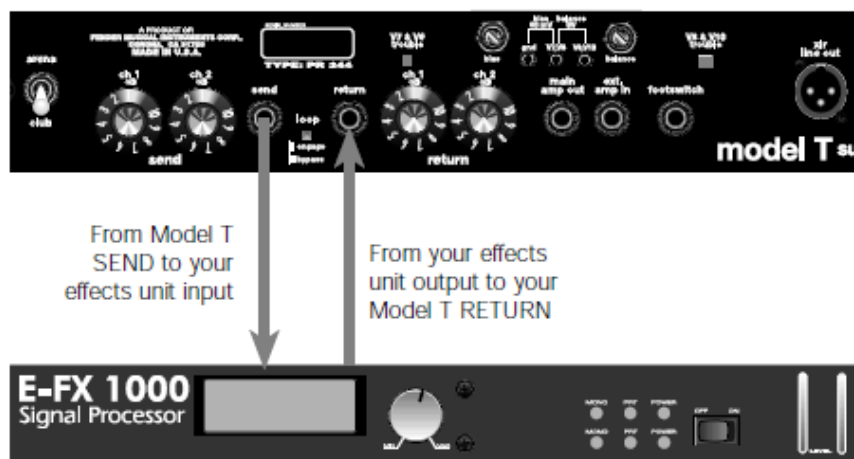
7. Turn the Channel 1 send control (item E, page 6) clockwise until the desired amount of signal is sent to your effects device. *Avoid very high settings of the send control as this could clip the input of your effects device.*

8. Carefully adjust the Channel 1 Return control (item J, page 6) until the amplifier's volume is matched when the effects loop is engaged or bypassed.

9. Repeat this procedure for the Channel 2 effects loop.

10. Re-connect the footswitch.

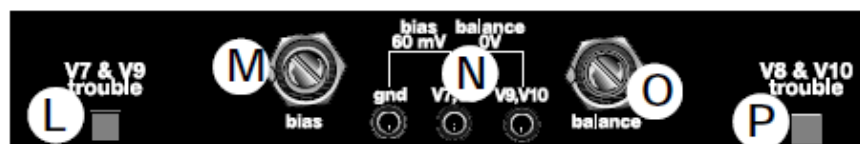
**IMPORTANT:** 1. If your effects device is distorting or clipping, reduce the send control until the distortion stops. Next, increase the return control to match the amplifier's volume when the effects loop is engaged or bypassed. 2. If you are unable to match the volume levels, make sure the input level and/or the output level controls are set properly on your effects device.



5. Connect your effects unit to the Model T effects loop (see illustration above).

6. Next, engage the loop by pressing the effects loop button in (item H, page 6).

## MODEL T REAR PANEL FUNCTIONS, CON'T



**L. V7 & V9 TROUBLE** - This LED indicates tube failure or trouble at the V7 or V9 tube locations. When the LED glows green, the tubes are operating properly. When the LED glows red, this indicates a tube failure which has blown the V7,V9 fuse located on the top surface of the chassis. If this fuse blows, replace it only with one of the same type and rating. **NEVER use a fuse with a higher current rating as this could damage the equipment and present a serious safety hazard.** Next, replace the tubes in locations V7&V9, check and adjust the bias and balance. If the amplifier repeatedly blows fuses, it should be taken to an authorized Fender service center.

**M. BIAS** - This trim adjustment is used in conjunction with the BALANCE (item O) and the bias test points (items N) to set the output tube bias.

**N. GND, V7&V8, V9&V10** - These are bias test points used to measure output tube bias and balance with a digital voltmeter.

**O. BALANCE** - This trim adjustment is used in conjunction with the bias test points (items N) and the bias adjustment (item M) to set the bias balance between the power amp tube sections of your Model T.

**P. V8 & V10 TROUBLE** - This LED indicates tube failure or trouble at the V8 or V10 tube locations. When the LED glows green, the tubes are operating properly. When the LED glows red, this indicates a tube failure which has blown the V8,V10 fuse located on the top surface of the chassis. If this fuse blows, replace it only with one of the same type and rating. **NEVER use a fuse with a higher current rating as this could damage the equipment and present a serious safety hazard.** Next, replace the tubes in locations V8&V10, check and adjust the bias and balance. If the amplifier repeatedly blows fuses, it should be taken to an authorized Fender service center.

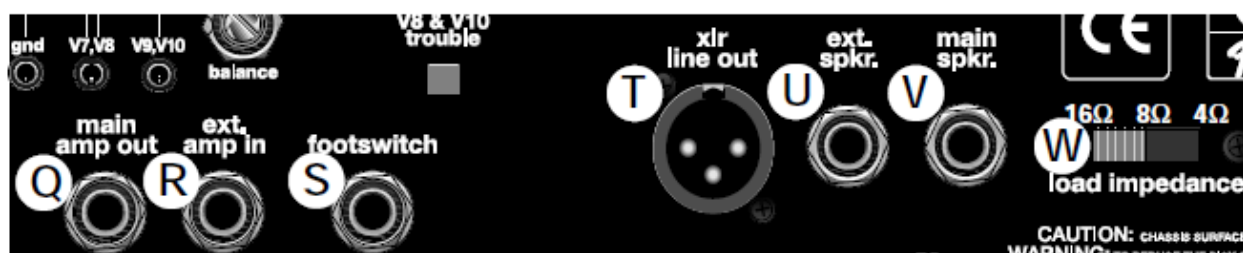
### *Output Tube Bias Adjustment Instructions*

1. Turn on your Model T and let it warm up for at least two minutes with the STANDBY switch (item M, page 5) in the ON position and the ARENA/CLUB (item D, page 6) switch in the Arena position.
2. Remove the bias controls cover box.
3. With a digital voltmeter set to its most sensitive DC voltage scale, measure the voltage between the GND and V7,V8 test points (items N) and adjust the BIAS control (item M) for a reading of .06 VDC (60 mVDC).
4. Connect the digital voltmeter to the V7,V8 and V9,V10 test points and adjust the BALANCE control (item O) for 0 VDC.
5. Replace the bias controls cover box.

### **Notes**

1. Make bias and balance adjustments **ONLY** when necessary. If you are unsure about setting bias and balance, take your amp to the nearest authorized Fender Service Center.
2. For optimum sonic performance, set bias to .06 VDC then set balance.
3. If the output tubes can not be balanced, check the bias setting and/or replace the 6L6GC output tubes.
4. The power tube trouble LEDs are NOT indicators of worn tubes. If your tubes are worn and sound weak the LEDs may still glow green. The trouble LEDs turn Red only after tube failure has already occurred. **DO NOT WAIT FOR TUBE FAILURE TO REPLACE TUBES.** (See Tube Replacement Section, page 11).

## MODEL T REAR PANEL FUNCTIONS, CON'T



**Q. MAIN AMP OUT** - This 1/4 inch, unbalanced, TS, output jack is designed to send a preamp line level signal from your "Main" Model T amplifier to another Model T amplifier. This jack is used for chaining multiple Model T amplifiers together and increasing your on stage volume. Do so by inserting a 1/4" cable from the MAIN AMP OUT jack into another Model T's EXT AMP IN jack.

**R. EXT AMP IN** - This 1/4 inch, unbalanced, TS, input jack is designed to receive a preamp line level signal from another Model T amplifier. This jack is used for chaining multiple Model T amplifiers together and increasing your on stage volume.

**S. FOOTSWITCH (INCLUDED)** - Plug-in connection for the footswitch. The footswitch allows the remote On / Off selection of the EFFECTS LOOP and switching of the two channels. Using the footswitch overrides the rear panel effects loop switch and the front panel channel select switch .

**T. XLR LINE OUT** - This balanced XLR male line level output is designed to feed the Model T's signal to an external power amplifier or main house mixer.

**U. EXTERNAL SPEAKER JACK** - Plug-in connection for an additional speaker enclosure. This jack is wired in parallel with the main speaker jack and must **ONLY** be used in conjunction with the main speaker jack. If this jack is used without the main speaker jack, no sound will be produced.

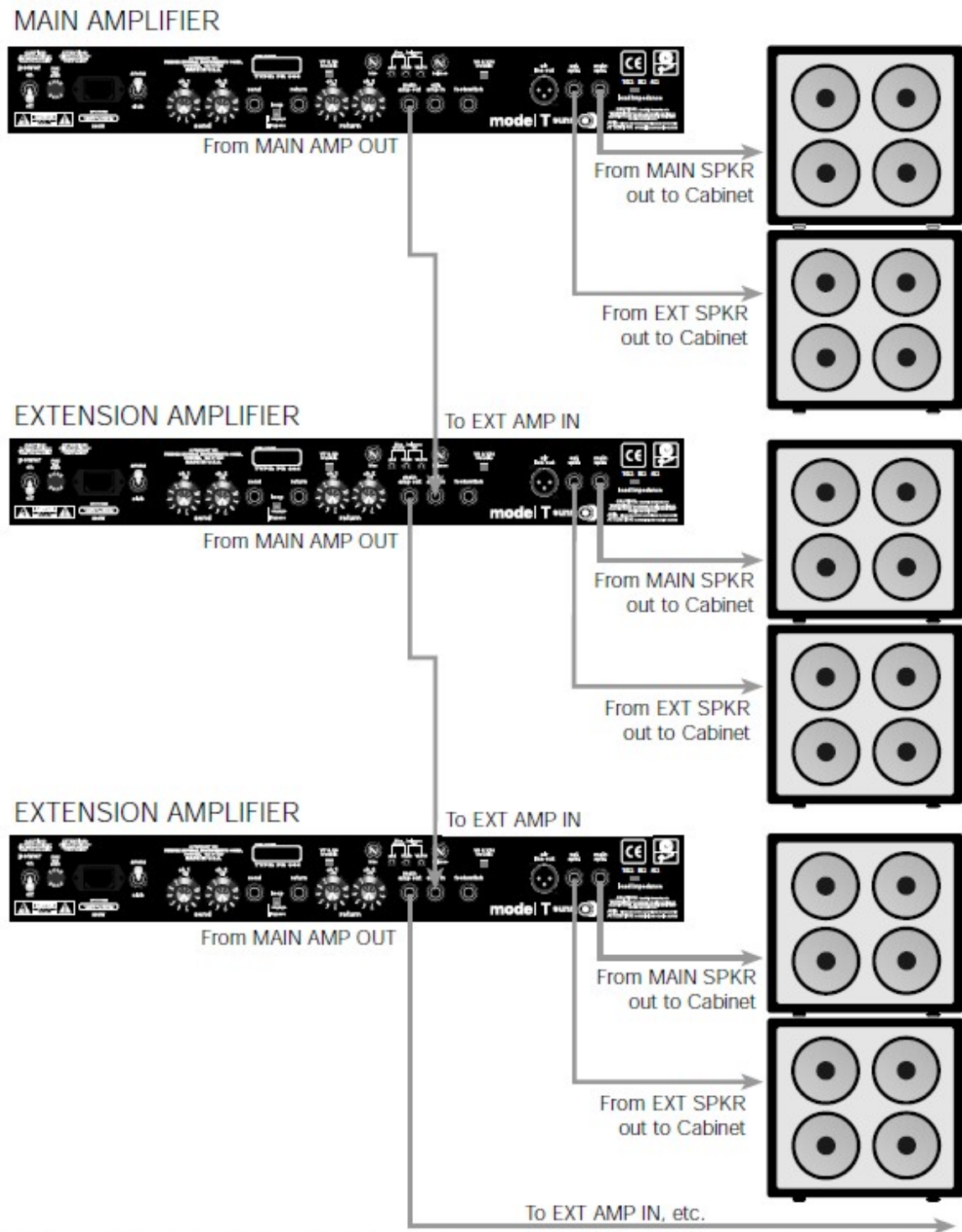
**V. MAIN SPEAKER JACK** - This is the main plug-in connection for your speaker enclosure and should always be used as the primary connection. If your Model T is in the on and ready to play position, make sure a load of at least 4Ω is present. Failure to do so may result in your Model T being damaged by using an improper impedance load. As a rule of thumb, ALWAYS connect or disconnect any speaker enclosure to your Model T with the power off.

**W. LOAD IMPEDANCE** - This switch allows the selection of different impedance loads for your loudspeaker enclosure(s). Make sure to match the total speaker's load impedance to the load impedance selector switch setting. Failure to do so may result in your Model T being damaged by using an improper impedance load.

Speaker Cabinets	LoadΩ
1 16Ω Cabinet	16Ω
2 16Ω Cabinets	8Ω
1 8Ω Cabinet	8Ω
2 8Ω Cabinets	4Ω



## STADIUM SET UP



1. To "chain" multiple Model T amplifiers together, simply connect a guitar cord from the MAIN AMP OUT jack on the rear of your main Model T to the EXT AMP IN on the next Model T. Repeat this procedure for as many amps as you care to chain together.

2. Remember, tone and volume settings of the main head control the tone and volume of all the Model T's in your setup regardless of the extension head settings. The presence controls, however, are still active on each Model T amplifier.

## TUBE REPLACEMENT



Tube life varies depending upon playing style and application. Power tubes have a much shorter life than pre-amp tubes which can last for years. For continued optimum performance from your amplifier, the tubes should **ONLY** be replaced with the same type tubes as specified on the tube illustration below.

A simple way to check if the tubes are worn is to replace the set in your amp with your spare set. (*You do carry spare tubes and fuses, don't you?*)

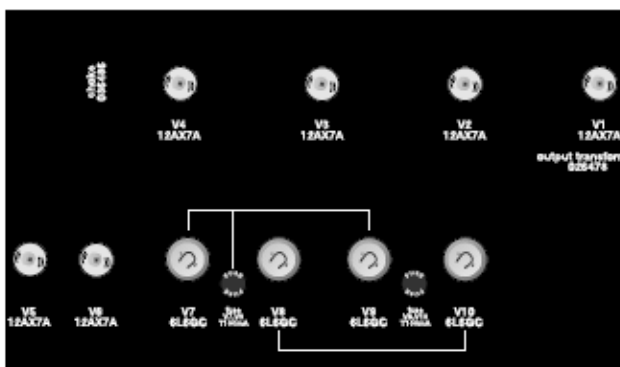
When changing the tubes, **ALWAYS** unplug the amplifier and remember **THE TUBES ARE HOT!** Either wait for the tubes to cool or use an insulated oven mitt to remove them from your amplifier.

- First, replace the OUTPUT tubes in the amplifier, re-bias and listen.
- Next, re-insert the original output tubes and re-bias. Replace the PRE-AMP tubes and listen.
- Finally, try replacing both the OUTPUT (re-bias) and PRE-AMP tubes and listen.

If there is a marked improvement in the tone of your amp at any point in this procedure, leave the new tubes in your amp and purchase another spare set.

Your Model T's tube compliment consists of:

- **Four 6L6GC Tubes** (part #053980),
- **Two 12AX7A Tubes** (part #023572), (tube locations V1 and V2)
- **Four 12AX7WA Tubes** (part #013341) (tube locations V3, V4, V5 and V6).



## TROUBLESHOOTER'S CHECKLIST



If the amp is set up but does not function, check the following items:

- Is the amp power cord properly plugged into an electrical outlet?
- Is there power to the outlet?
- Is the fuse blown?
- Is the speaker(s) properly connected to the amplifier?
- Is the amp on standby?
- Are the amplifier VOLUME, TREBLE, MID and BASS controls above 1?
- Is the instrument volume control turned up?
- Is the instrument plugged into the amplifier?

(Eliminate any effects pedals, disconnect any effect devices from the effects loop and try another guitar cord.)

Check under all tube covers to see if the tube filaments are glowing.

If, after checking all of the above, your amplifier is not performing correctly, consult your nearest authorized Fender service center.


## COVERING CARE



Your Model T is covered in genuine Tolex® for long life and lasting good looks. To clean the Tolex covering, use a sponge and a light soapy water solution. Avoid spilling liquids on the operating surfaces, grill, volume and tone controls and switches. **ALWAYS** unplug your amplifier before cleaning or approaching it with fluids.

## MODEL T SPECIFICATIONS

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TYPE	PR 344	
PART NUMBER	021-3373 (100V) 021-3303 (120V) 021-3343 (230V) UK 021-3363 (230V) Eur 021-3333 (240V) Aust	CE 
POWER REQUIREMENTS	100V AC, 50/60 Hz 360W 120V AC, 60 Hz, 360W 230V AC, 50 Hz, 360W 240V AC, 50 Hz, 360W	
POWER OUTPUT	120W R.M.S. Arena 29W R.M.S. Club 1kHz sine into 8 $\Omega$ @ 5% T.H.D. Presence @ "1"	
INPUT IMPEDANCE	1 M $\Omega$	
TUBES	Four 6L6GC Tubes (part #053980), Two 12AX7A Tubes (part #023572), Four 12AX7WA Tubes (part #013341)	
FUSE	T4A 250V fuse for 100V and 120V versions T2A 250V fuse for 230V and 240V versions	
SPEAKER	Designed for use with Sunn 412 Loudspeaker Enclosures	
FOOTSWITCH	2 Button Footswitch, (P/N 053584) Controls Channel and Effects Loop Select	
DIMENSIONS	Height: 10.2 in 25.9 cm Width: 24.5 in 62.2 cm Depth: 11.6 in 29.5 cm	
WEIGHT	45 lbs 20.4 kg	

## THE SUNN® 412 LOUDSPEAKER ENCLOSURE

Your new Sunn 412 Loudspeaker Enclosure is constructed from 5/8" (1.6 cm) 11-ply Birch Plywood and is capable of handling up to 300 Watts of powerful clean sound. The Sunn 412 features four 12" (30.5cm) speakers with 54 oz (1.53 kg) magnets and is designed for use with the Sunn Model T or any other professional quality instrument amplifier. In order to more fully understand the operational characteristics of your Sunn 412 loudspeaker enclosure, please read through all instructions and heed all caution and safety warnings on both your amplifier and Sunn 412 loudspeaker enclosure.

### CONNECTING MULTIPLE 412 LOUDSPEAKER ENCLOSURES

Because the Sunn 412 Loudspeaker Enclosure's jacks are wired in parallel, multiple 412 cabinets can be "daisy chained" together providing additional output for larger venues. To do so, simply connect them by inserting a speaker cable (16 gauge or larger) with a 1/4" plug into the input jacks on the rear panel of each cabinet. *Note: If using a tube amplifier your tube amp could fall into protect mode or even be damaged by using an improper impedance load. Therefore, it is important to heed all caution and safety warnings on both your amplifier and Sunn 412 loudspeaker enclosure.*

From  
AMP



### SPECIFICATIONS

PART NUMBER	021-1675-000
DRIVERS	Four 12" (30.5 cm) Steel Frame Drivers 1 3/4" (4.5 cm) voice coils 54 ounce (1.53 kg) magnets
CABINET	5/8" (1.6 cm) 11-ply Birch Plywood
SENSITIVITY	96 dB, 1 Watt - 1 Meter
POWER HANDLING	300 Watts
IMPEDANCE	16Ω
CONNECTIONS	Dual, Parallel Wired, 1/4" High Current Input Jacks
ENCLOSURE VOLUME	V <sub>a</sub> = 5.2 ft <sup>3</sup> (147 l)
DIMENSIONS	Height: 30 in. (76.2 cm) Width: 30 in. (76.2 cm) Depth: 15 in. (38.1 cm)
WEIGHT	99 lbs. (45.0 kg)

A PRODUCT OF:  
FENDER MUSICAL INSTRUMENTS CORP.  
CORONA, CA 91720 USA