

INSTRUCTION MANUAL

Clegg

SS BOOSTER TYPE A

Squires - Sanders, Inc.

MARTINSVILLE ROAD / LIBERTY CORNER • MILLINGTON, N.J. 07946

CLEGG SS BOOSTER

TYPE A

INSTRUCTION MANUAL

I. Unpacking

The SS BOOSTER has been packed with adequate internal carton bracing and cushioning to withstand normal handling in shipment on common carriers. Examine the carton exterior for signs of severe damage (crushing, piercing, etc.) In the event of obvious serious damage, examine the equipment carefully to determine the extent of internal damage, save packing material and make claim against transportation company.

Check all front panel controls for freedom of action and observe that all tubes are firmly seated in their sockets. Complete and mail the equipment registration card.

II. Description

The Clegg SS BOOSTER is specifically designed for use with the Clegg VENUS VI. For the first time it makes possible effective speech clipping of single-sideband speech with resulting average power increases of 10 db or more -- without "flat-topping" or "splatter". Under most conditions it can provide an increase in "talk power" equivalent to increasing transmitter power by as much as 10 times.

The BOOSTER does this by taking the DSB output of the VENUS VI (at 9MC) and filtering it in a sideband filter to make conventional single-sideband. This signal is then greatly amplified and then clipped by a diode pair. Since this clipped signal contains unwanted sideband components and other distortion products, the signal is filtered again to reform a clean SSB signal (using the filter in the VENUS VI). As a result the average power -- and intelligibility of the original SSB speech has been enhanced or "boosted" by the amount of clipping performed, up to 10 or 20 db depending on individual voice characteristics.

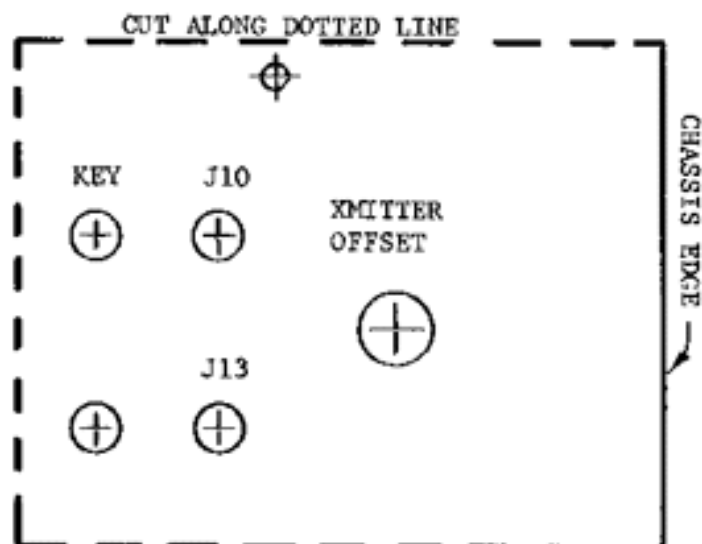
III. - A INSTALLATION

1. Should your Venus have a serial number starting with 617 or 608 it must be modified to accept the Booster cables. (see paragraph B) Modification kit for Venus enclosed with Booster.
2. This modification may be done by:
 - a) Your nearest Squires-Sanders Warranty Station.
 - b) Your local Squires-Sanders distributor.
 - c) Yourself following our instructions (see paragraph B)
3. Should you have any difficulties installing a Booster or getting your Venus modified please write to our Customer Service Department for assistance.

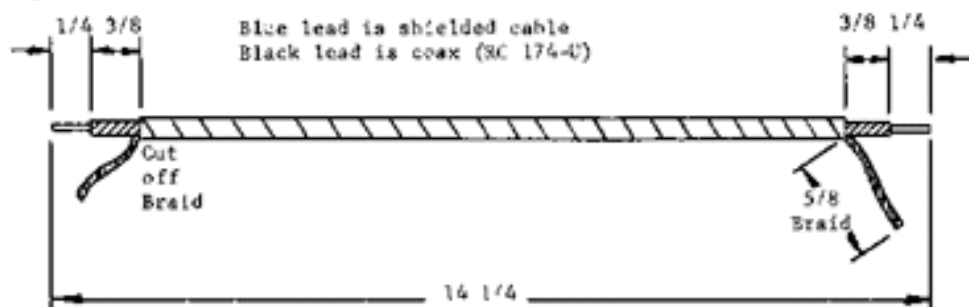
III. - B INSTALLATION

Tools required:

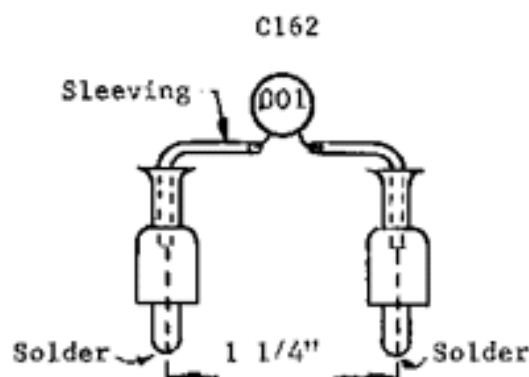
Electric or hand drill
 1/8" drill (used as a starter)
 1/4" drill
 Center punch
 60 Watt soldering iron
 rosin core solder (not acid core)
 Long-nose pliers
 Wire cutters
 Straight blade screw driver
 Phillips head screw driver
 Small adjustable wrench



1. Remove the VENUS from its cabinet by removing the 2 phillips head screws on the top of the front panel, 2 slotted head screws on the bottom of the cabinet, 3 slotted head screws on the rear of the cabinet.
2. Refer to fig. #1 and remove the Xmitter Offset control from its mounting hole, located on the rear of the chassis. (DO NOT UNSOLDER ANY CONNECTIONS). Set the hardware aside as it will be used later in step #8.
3. Cut out the template on the top of the page and position it over the Xmitter Offset control mounting hole. (Refer to fig. #1)
4. Mark and center punch "J10" and "J13".
5. Select the starter drill, carefully drill J10 and J13, be careful that the drill doesn't run into the harness or any components.
6. Using the 1/4" drill, carefully drill J10 and J13. Remove any burrs and drilling chips.
7. Refer to fig. #1 b, place a phono jack in J10 and J13, mount the jacks with a 1/4" lockwasher and nut. Tighten them in place with any suitable wrench.
8. Refer to fig. #1 a, place the new terminal strip and the 3/8" lockwasher on the threaded shaft bushing of the Xmitter Offset control. Mount the control and the terminal strip as shown in fig #1 a & 2.
9. Refer to fig. #3, carefully remove and discard the bare wire jumper that connects R23 (220 ohms, red-red-brown) to L8c (the winding on L8 that is closest to the chassis). Refer to the original schematic in the instruction book, and the new schematic on fig. #4 in this manual.
10. Prepare the black and blue leads as shown:



11. Refer to fig.#2, connect the braid of the black lead to TS-B2 (NO SOLDER).
12. Connect the inner conductor, of the black lead, to TS-B1 (NO SOLDER).
13. Refer to fig. #3, dress the black lead under the harness and along the side of the chassis to the junction of R23 (220 ohms, red-red-brown) and its terminal strip where the jumper was removed. (SOLDER)
14. Refer to fig.#2, connect the braid of the blue lead to TS-B2, connect the inner conductor of the blue lead to phono jack J13. (SOLDER both braids and J13)
15. Refer to fig. #3 dress the blue lead under the harness and along the side of the chassis to L8c, where the other end of the jumper was removed. (SOLDER)
16. Cut one end of the R159 15K (brown-green-orange) resistor to 5/8" and connect it to the junction of R78-120K (brown-red-yellow), R81-22K (red-red-orange) and C79 - 0.1MF @ 400 volts tubular capacitor. (SOLDER) See Fig.2.
17. Refer to fig. #2, connect the remaining end of the 15K resistor to J10. (NO SOLDER)
18. Connect a .001 Mf disc capacitor between J10 and TS-B1 as shown in fig.#2. Solder all connections.
19. Connect and solder the two phono plugs and C162, .001 Mf disc capacitor as shown:



20. Plug this capacitor into J10 and J13.
21. Adjust the transmitter for "CW" operation per page 9 steps 1 thru 7 in the VENUS instruction manual.
22. With the VENUS adjusted for maximum output, adjust L8 for maximum power output. This completes the modification and testing.

IV. Operation

1. With C162 jumper across VENUS J10 and J13 tune VENUS for normal SSB operation (into dummy ant.).
2. Remove jumper plugs (and C162) from jacks J10 and J13 at rear of VENUS.
3. Connect shielded cables between VENUS and BOOSTER as follows:
 - a) Between BOOSTER OUTPUT and VENUS J10.
 - b) Between BOOSTER INPUT and VENUS J13.
4. Connect BOOSTER to 115 VAC power source and switch ON. Observe that BOOSTER panel light ignites.
5. Set SPEECH GAIN (on VENUS) to 3 o'clock.
6. Depress Push to Talk switch on Mike and whistle a continuous note simultaneously varying PEAK POWER control. A position of this control will be found where further rotation causes no increase in VENUS cathode current.
7. Set the PEAK POWER control just below the saturation level found in step 6 above. This setting will normally be between 6 and 8. If the setting found is below 5 or above 9 the BOOSTER gain should be readjusted. (See BOOSTER GAIN ADJUSTMENT)

BOOSTER Gain Adjustments

Set PEAK POWER control at 7 and repeat step 6 above except vary the INTERNAL GAIN ADJ. (R13) instead of the PEAK POWER control. R13 is located on the top of the BOOSTER chassis between the IF transformer and the electrolytic capacitor. It may be adjusted through the top perforations in the cabinet if a suitable long thin screw driver is available or the BOOSTER may be removed from the cabinet.

V. Precautions

Since the SS BOOSTER increases the average power input (and output) the final amplifier used must have adequate ratings to accept this increased power input without damage or distortion. The VENUS VI is so designed. You will note that whereas without Boost the plate current "picks" up scale only on voice peaks, with Boost the plate current stays up-scale most of the time (averaging slightly less than 100 ma).

If the VENUS VI is used with a linear amplifier, make sure that the linear will withstand the increase in average power input. PEP ratings are not significant; the CW ratings are. With the Booster in use, the average power will be nearly equal to the peak power, so the tubes and power supply must be capable of operating continuously at (the equivalent of) full CW input.

Since the BOOSTER increases the system gain by the amount of Boost, background noise will be correspondingly increased. Fans, air conditioners and household noises may be adequate to provide considerable background signal, usually noticed only by "locals" for whom the NORMAL mode should be used. The use of a close-talking microphone as provided with the VENUS VI is also beneficial.

FIG. 1

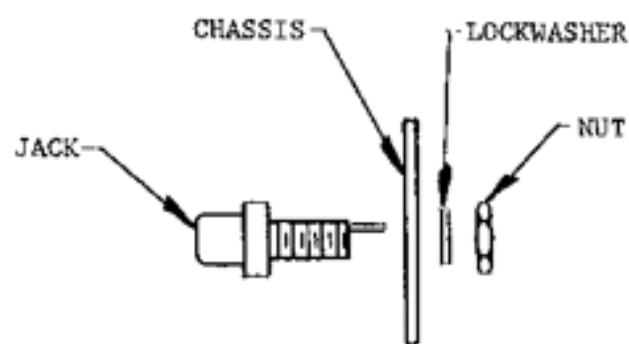
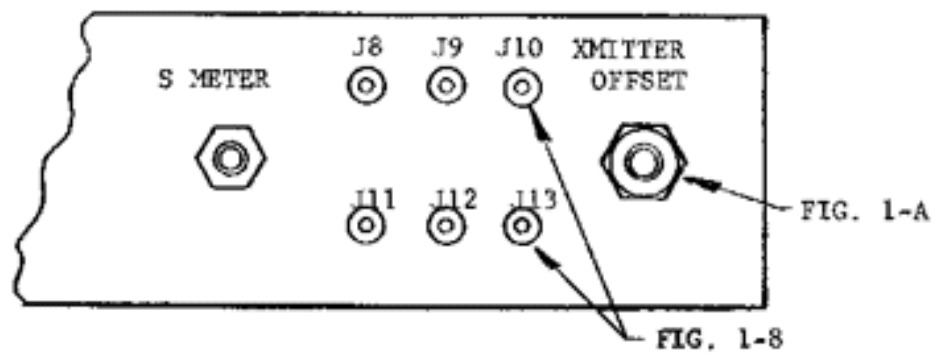


FIG. 1-B

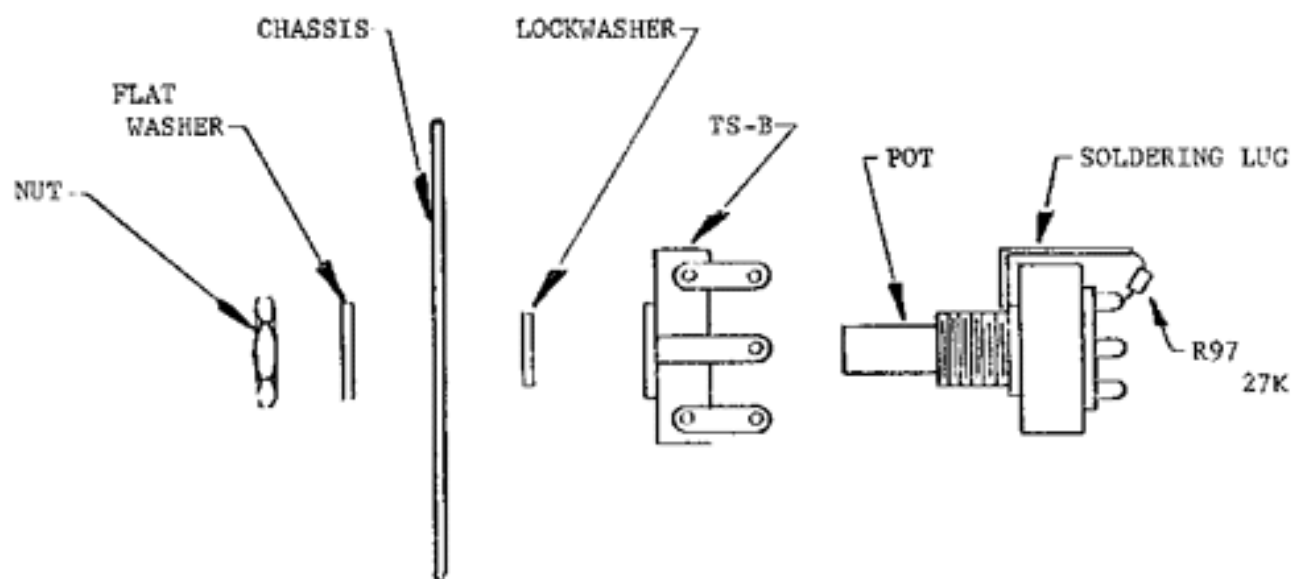


FIG 1-A

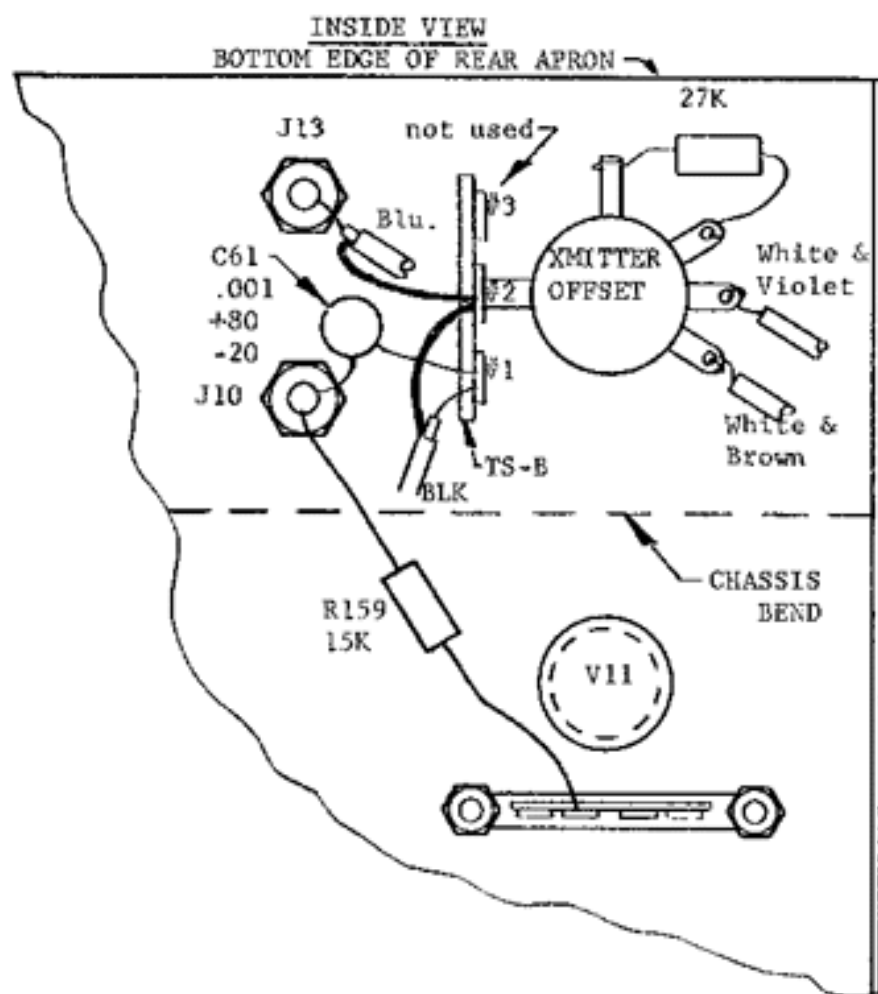


FIG. 2

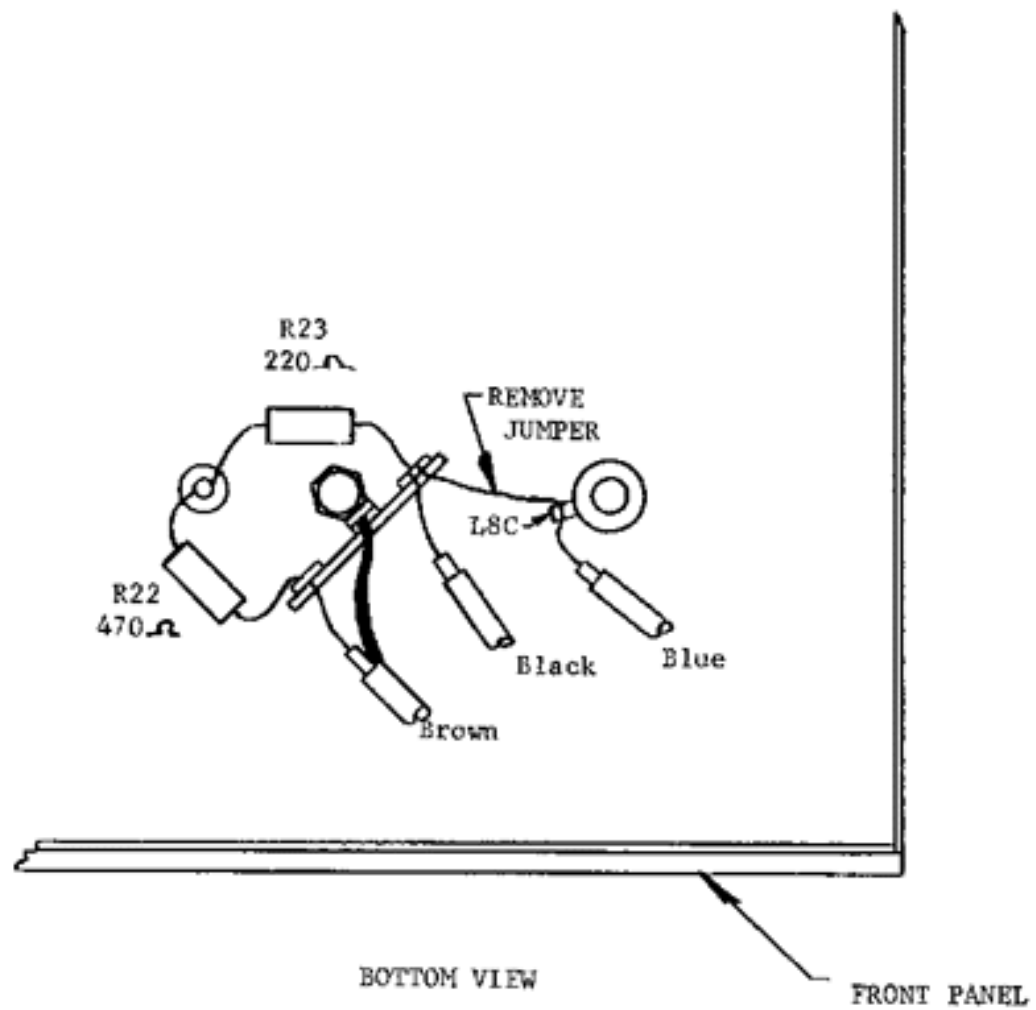
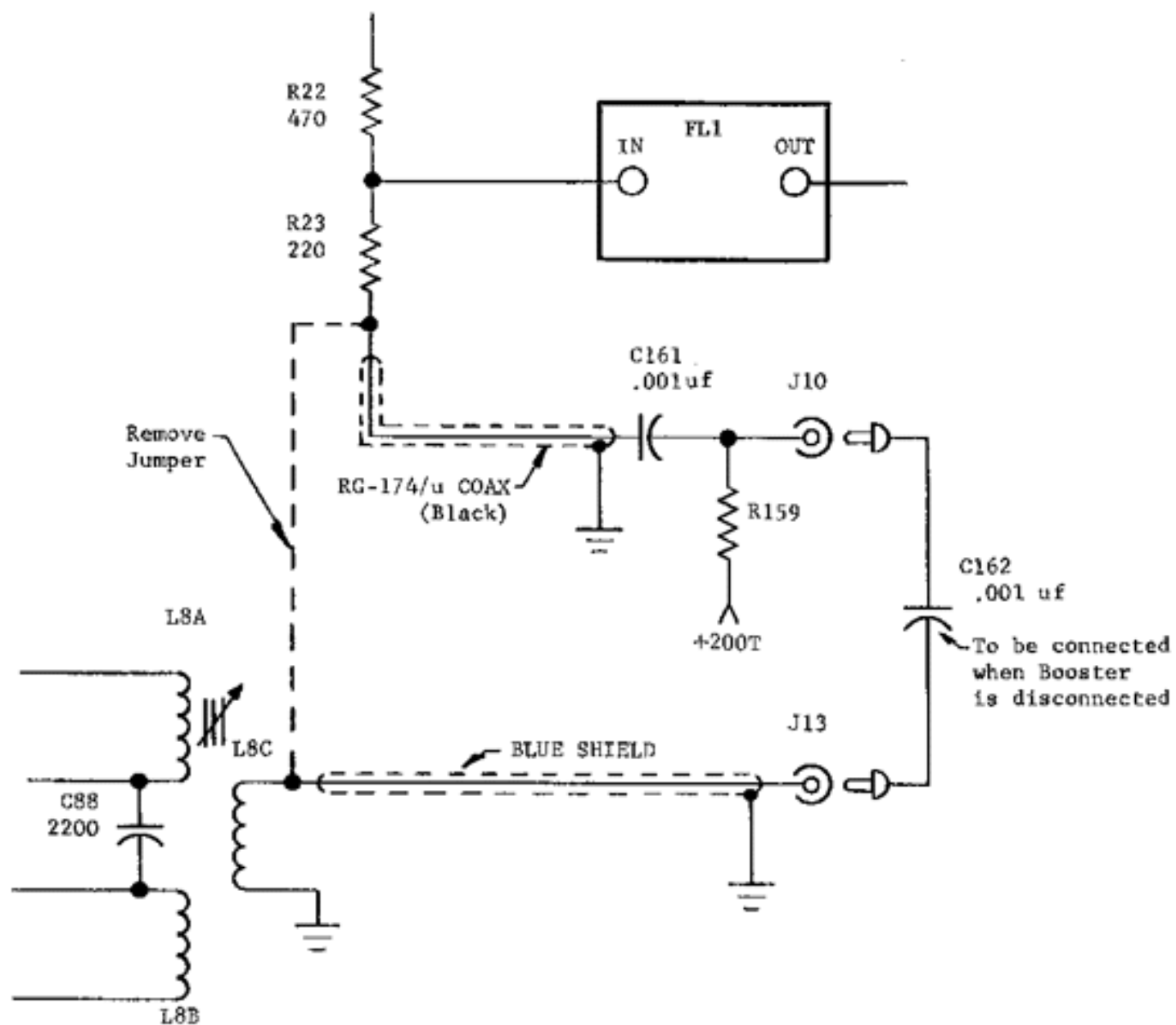
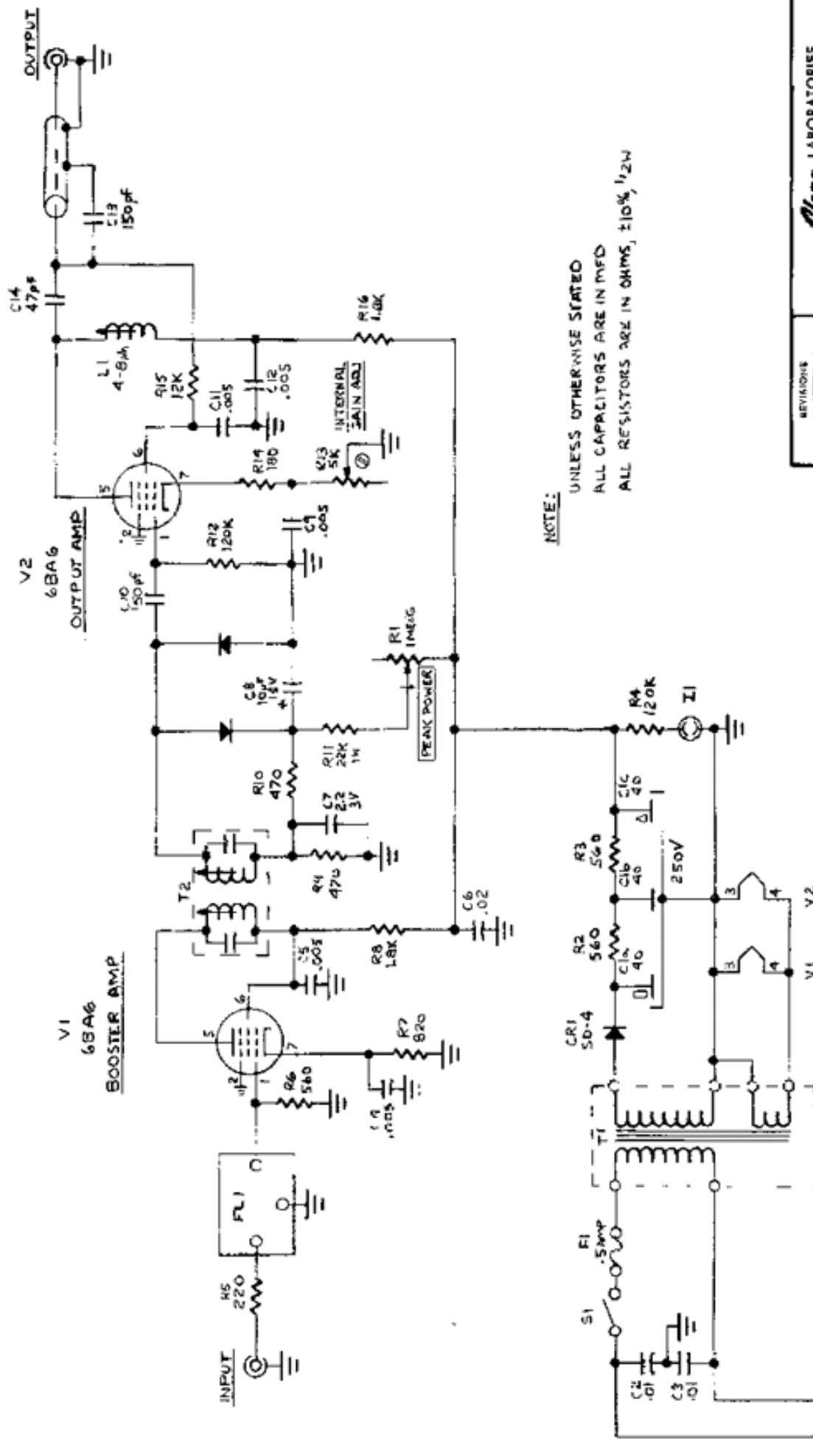


FIG. 3





NOTE:

UNLESS OTHERWISE STATED
ALL CAPACITORS ARE IN MFD
ALL RESISTORS ARE IN OHMS

REVISIONS		Class LABORATORIES DIV. OF SQUARE - SANDUSKY, N.Y.	
NO.	DATE	BY	
1			
2			
3			
4			
5			

SCHEMATIC DIAGRAM
VENUS SS BOOSTER

DRAWN BY <i>W. J. [Signature]</i>	SCALE NONE	MATERIAL DELSOLAR POL.
DATE 9/28/64	APP'D [Signature]	

R10-603A

SECTION
CLEGG SS-BOOSTER

<u>Item</u>	<u>Description</u>	<u>Part No.</u>
C1	Capacitor, Electrolytic 40/40/40MFD, 250 V	108-206
C2	Capacitor, Disc, Ceramic .01MFD, 500V	102-054
C3	Capacitor, Disc, Ceramic .01MFD, 500V	102-054
C4	Capacitor, Disc, Ceramic .005 MFD, 500V	102-050
C5	Capacitor, Disc, Ceramic .005MFD, 500V	102-050
C6	Capacitor, Disc, Ceramic .02MFD, 500V	102-056
C7	Capacitor, Disc, Ceramic 2.2MFD, 3V	102-062
C8	Capacitor, Disc, Electrolytic 10MFD, 15V	107-006
C9	Capacitor, Disc, Ceramic .005MFD, 500V	102-050
C10	Capacitor, Disc, Ceramic 150 pf, 500V	101-000
C11	Capacitor, Disc, Ceramic .005MFD, 500V	102-050
C12	Capacitor, Disc, Ceramic .005MFD, 500V	102-050
C13	Capacitor, Disc, Ceramic 150pf, 500V	101-000
C14	Capacitor, Disc, Ceramic 47 pf, 1Kv, NPO	100-120
CR1	Diode Silicon SD-4	142-004
CR2	Diode Germanium 1N34A	141-001
CR3	Diode Germanium 1N34A	141-001
FL1	Crystal Filter 9MC	265-001
F1	Fue 3AG 1/2 Amp	160-015
I1	Lamp, Neon Red Lens	153-002
L1	Coil RF Slug-tuned 4-8 Uh	182-009
R1	Resistor, Variable, "S" Taper 1MEG, 1/2W	240-008
R2	Resistor, Fixed, Composition 560 ohm, 10% 1/2W	223-561
R3	Resistor, Fixed, Composition 560 ohm 10% 1/2W	223-561

Item	Description	Part No.
R4	Resistor, Fixed, Composition, 120K, 10% $\frac{1}{2}$ W	223-124
R5	Resistor, Fixed, Composition, 220 ohm, 10% $\frac{1}{2}$ W	223-221
R6	Resistor, Fixed, Composition, 560 ohm, 10%, $\frac{1}{2}$ W	223-561
R7	Resistor, Fixed, Composition, 820 ohm, 10%, $\frac{1}{2}$ W	223-821
R8	Resistor, Fixed, Composition, 1.8K, 10%, $\frac{1}{2}$ W	223-182
R9	Resistor, Fixed, Composition, 470 ohm, 10% $\frac{1}{2}$ W	223-471
R10	Resistor, Fixed, Composition, 470 ohm, 10%, 1/2W	223-471
R11	Resistor, Fixed, Composition, 22K, 10%, 1W	225-223
R12	Resistor, Fixed, Composition, 120K, 10%, $\frac{1}{2}$ W	223-124
R13	Resistor, Variable, Composition, 5K, 10%, 2W	240-009
R14	Resistor, Fixed, Composition, 180ohm, 10%, $\frac{1}{2}$ W	223-181
R15	Resistor, Fixed, Composition, 12K, 10% $\frac{1}{2}$ W	223-123
R16	Resistor, Fixed, Composition, 1.8K, 10%, $\frac{1}{2}$ W	223-182
S1	Switch, Toggle, SPST	283-003
T1	Transformer, Power	601-010
T2	Transformer, IF, 10.7 MC	602-002
V1	Tube, Electron 6BA6	216-009
V2	Tube, Electron Type 6BA6	216-009
	Jumper Assembly	800-507
	C162 - Capacitor, disc., cerm .001 mf + 80 -20% 1KV	102-039
	P1. - 1 pin phone jack single hold mount	293-003
	P2. - " " " " " "	" "
	Cable Assemblies:	
	Input and Output 2 pieces	505-005

VENUS MODIFICATION KIT FOR CLEGG SS-BOOSTERPARTS LIST

<u>Item</u>	<u>Description</u>	<u>Part No.</u>
C161	Capacitor, Disc Cerm. .001mf, 500V	102-039
R159	Resistor, Fixed, Comp. 15K, 10%, 1/2W	223-153
J10 & J13	Phone jack, female, 1/4"	293-003
1	RG-174/u Coax Cable - 14 $\frac{1}{2}$ " Long	511-002
1	Blue Shielded Cable - 14 $\frac{1}{2}$ " Long	504-006
1	3 lug terminal strip w/3/8" mounting	334-215
2	Lockwashers - $\frac{1}{8}$ " I.D. Int. Tooth	318-308