

**CR 165B PREAMPLIFIER**

SLM ELECTRONICS  
1400 FERGUSON  
ST LOUIS MO 63133  
RHS 9/1/82 1 of 2  
DWG # 16-063-01

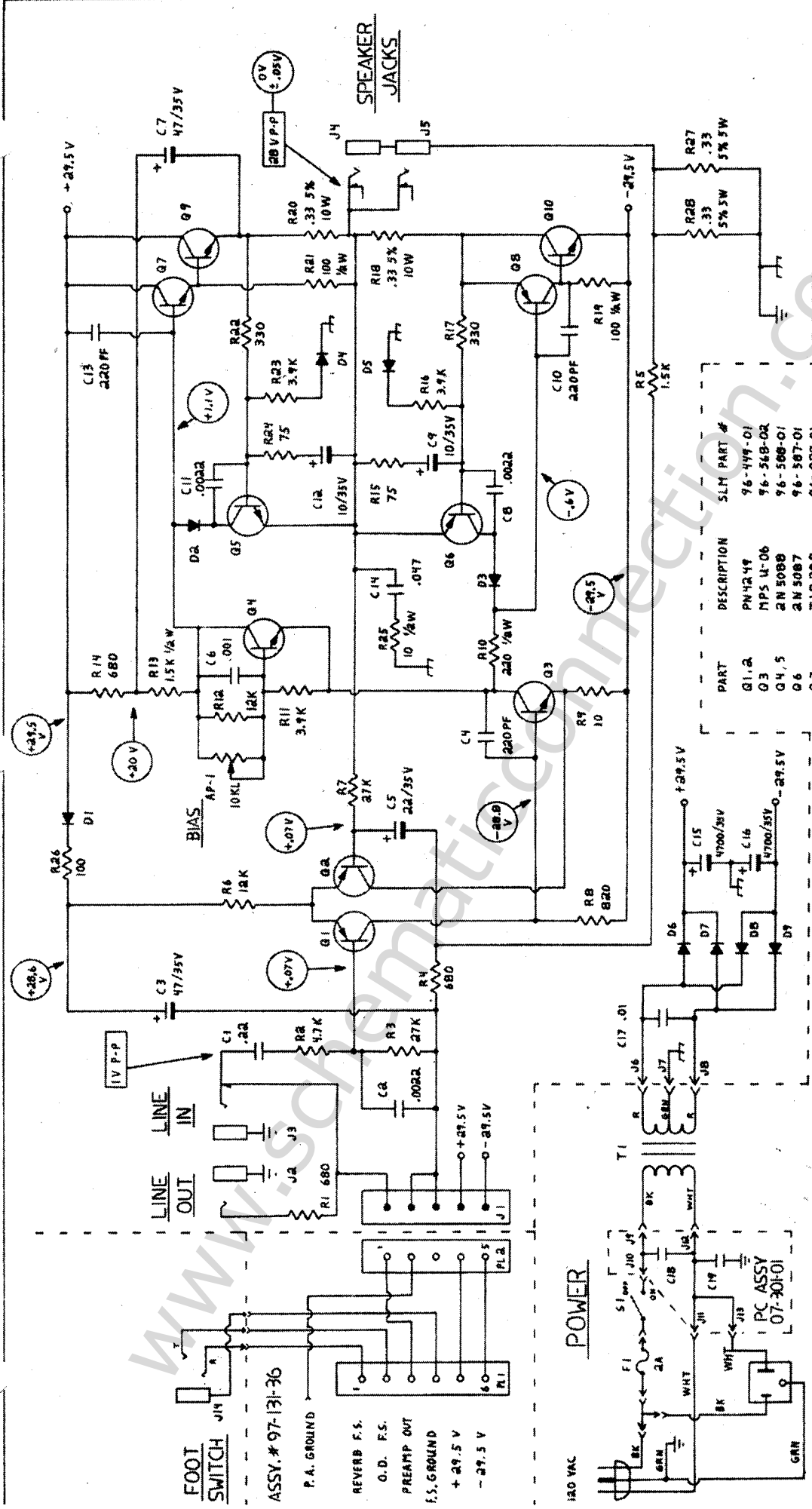
**NOTES:**

- EXCEPT AS NOTED, ALL CAPACITORS IN MFD @ 100V, ALL RESISTORS IN OHMS @ 1/4 WATT 5% TOLERANCE
- ALL VOLTAGES MEASURED WITH 1 MEGOHM INPUT OSCILLOSCOPE (AC) 10 MEGOHM INPUT DVM (DC). TAKE LOADING INTO ACCOUNT IF USING OTHER EQUIPMENT.

AC SIGNAL VOLTAGE: GAIN@5, TONES@0, BRITE@0, MASTER@10,  
LIMITER@0, 1KHZ SINE WAVE INPUT, 4 OHM LOAD  
 SAME BUT GAIN@10 LIMITER@10 \*-APPROXIMATE  
 DC VOLTAGE: NO SIGNAL INPUT \* - APPROXIMATE

PART	DESCRIPTION	SLM PART #
Q1	2N5638	96-538-01
Q2	2N5007	96-587-01
IC1-3	RC4558	37-458-01
D1-2	1N4745	21-145-01
D3-6	RED LED ASSY	97-221-01
D4-5	1N914	21-914-01
J1,2	RN12APC	38-012-02
J3	4 PIN HEADER	17-310-04
AP-1,2	10K TRIMPOT	71-103-01
PI,4	50K RA	70-503-13
P2-3,5	50K L	70-503-11
S1	JU02	88-102-01
KN05	0-10	45-110-01
	5-0-5	45-505-01

P.C. ASSY. 07-549-01



PC ASSY 07-401-01

PART	DESCRIPTION	SLM PART #
Q1, 2	PN4249	96-449-01
Q3	NPS U-06	96-568-02
Q4, 5	2N 5088	96-568-01
Q6	2N 5087	96-567-01
Q7	T1P 249	96-029-01
Q8	TIP 30B	96-030-01
Q9, 10	SJ4353	96-355-01
D1-5	1N914	21-914-01
D6-9	1N5392	21-192-01
J1	5PIN R.A.	17-311-05
J2-5	112 APC	59-012-01
J6-13	.230" RA, TAB	17-901-01
J14	12B	39-015-01
AP-1	10KΩ TRIMMER	71-103-01
T1	TRANSFORMER	97-115-10
S1	C102 5W	88-210-01
C18, 19	.0027 (U.L.)	18-272-01

- NOTES:
- EXCEPT AS INDICATED, ALL CAPACITORS IN MFD @ 100 VDC, ALL RESISTORS IN OHMS @ 1/4 WATT 5% TOLERANCE.
  - VOLTAGES MEASURED WITH: 1 MEGOHM INPUT OSCILLOSCOPE (AC), 10 MEGOHM INPUT DVM. (DC). TAKE LOADING INTO ACCOUNT IF USING OTHER EQUIPMENT.
    - AC SIGNAL VOLTAGE: 1 KHZ SINE WAVE INPUT, 4 OHM LOAD
    - DC VOLTAGE: NO SIGNAL INPUT
  - BIAS VOLTAGE: NO SIGNAL, NO LOAD, @ 120 VAC LINE
    - AT TURN-ON: 3.5 mv ACROSS R20
    - AFTER 30 MIN: 6 mv ACROSS R20

**CR 160 POWERAMP/SUPPLY**

REV 10/61

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7/14/81 | 2 of 2



## TECHNICAL TIPS - CR-165B

## 1. Plastic Input Jacks:

These jacks are specified to have a tightening torque of 100 - 110 inch ounces (6.8 inch lbs) applied to the panel nut. The threads will be stripped if overtightened. so care should be taken if they are tightened without a torque wrench. 110 inch ounces is a tight "two finger" torque (holding nutdriver with thumb and first finger only). The jacks must be tight enough for the lockwashers to bite through the paint on the inside of the chassis and make contact with the metal. In case of doubt, check for continuity between the chassis and the input jack sleeve connection.

## 2. "No sound" Complaints and The Line In Jack:

The CR-165B "Line In" jack is connected such that the signal from the preamp comes in on an internal switch contact in the jack (J3). If no plug is inserted in the "Line In" jack, this switch contacts the "tip" connection of the jack, and the preamp signal enters the power amp input. When a plug is inserted in the "Line In" jack, this connection is broken, and only the external signal can enter the power amp.

If the "Line In" jack is damaged, the switch may fail to make contact when nothing is plugged into "Line In". In this case a "no sound" condition will result, and replacement or repair of the "Line In" jack will be necessary.

## 3. Grounding During Testing:

The speaker jacks of the CR-165B are not at ground potential. Two .33 ohm 5 Watt resistors are connected in series, forming part of the feedback circuits (providing controlled damping of the speaker).

When connecting the speaker output to test equipment, keep the speaker jack "common" separated from chassis or input (signal source) ground. If these are connected together, either through the test setup or through the test equipment power cord ground wires, oscillations, "motorboating" etc. may result. Because most oscilloscopes have their chassis ground common to their signal input ground, you may find it convenient to connect an oscilloscope between chassis ground and speaker jack (continued)

## TECHNICAL TIPS - CR-165B (Contd)

### 3. Grounding During Testing (Cont'd)

"tip" contact, rather than across the output jack directly. Speakers "dummy loads" and voltmeters (when measuring output power) should be plugged into the speaker jack directly for proper operation and correct measurements.

### 4. Testing The "Controlled Damping" Circuit:

The CR-165B has an added feedback network (R27, R28, and R5) to provide a controlled "damping" effect on the motion of the speaker. In order for the amplifier to perform properly this circuit must be working.

The Test procedure is as follows:

A. Apply an input signal at 1KHZ, and adjust the amplifier for an output below clipping with no load. Note the output voltage.

B. Connect a 4 ohm load to the output. The output voltage should drop to between one half and three fourths of the no-load output voltage.

Several conditions which can prevent proper operation of the damping circuit are:

- missing or misaligned insulating washers on the speaker jacks.
- metal particles or shavings trapped under insulating washers
- test setup may be shorting the speaker jack "common" to chassis ground (see Note 3)
- defective R28 or R27

### 5. Adjustment of the "Limiter" Circuit:

#### A. Limiter

- 1). Apply a 1KHZ signal to the input jack at approximately 1 V.P.P with BASS and TREBLE at "0" (flat) and BRITE "off", MASTER at "0".
- 2). Set trimmer AP-1 fully counterclockwise (viewed from front of chassis).
- 3). Adjust GAIN until signal at pin 1 of IC 2 is just below clipping.

(continued)

## TECHNICAL TIPS - CR-165B (Continued)

- 4). Adjust AP-2 until signal at pin 1 of IC3 is reduced in level by  $\frac{1}{2}$ db.
- 5). Set MASTER and LIMITER to "10" and adjust trimmer AP-2 until Power Amp output (with 4 ohm load, 120 VAC line Voltage) is just barely into "clipping"  
The LIMITER L.E.D. should be lit.

This adjustment should not be needed unless Q1, Q2 the LIMITER control (P4), or an associated part is replaced.

**B. LIMITER L.E.D.**

There is no adjustment provided for the Limiter L.E.D. however, if desired its operation may be checked as follows:

- 1). Apply a 1 V.P.P. (approx) 1KHZ signal at the input jack set GAIN at "0", LIMITER at "0", MASTER to any convenient setting.
- 2). Increase the GAIN until limiting just begins (when output level is  $\frac{1}{2}$ db higher when LIMITER is set to "0" than when it is at "10")

At this point the limiter L.E.D. should be lit.