050-0706-01
M21814,M23051
M23390
See Below

U745* REPLACEMENT

For the following TEKTRONIX® Oscilloscopes:

Type 7844 Serial Numbers B010100 - B040233
Type R7844 Serial Numbers B010100 - B030136
Type R7903 Serial Numbers B010100 - B100367
Type 7904 Serial Numbers B010100 - B154159
Type R7912 Serial Numbers B010142 - B090341

This Parts Replacement Kit includes kit, pn 050-0651-XX (a 155-0065-00 IC with selected resistors), and additional selected components necessary to compensate for the increased frequency response of the 155-0065-00 IC.

*Except 7844/R7844. Beam 1 IC is U1745 and Beam 2 is U2745.

NOTE

If the serial number of your instrument is above those listed or if this kit has been installed, disregard the instructions for this kit and use the included Parts Replacement Kit, pn 050-0651-XX, to replace U745 (R7903, 7904, 7912) or U1745 or U2745 (7844 and R7844).

PARTS INCLUDED IN PARTS REPLACEMENT KIT:

Ckt. No.	Quantity	Part Number	Description
	1 ea	050-0651-01	Kit, Parts Replacement, U745
L667[1,2]	1 ea	114-0222-00	Coil, 2-6μH
Q786	1 ea	151-0126-00	Transistor, NPN
Q785	1 ea	151-0390-00	Transistor, NPN
	1 ea	210-0698-00	Rivet
R786	1 ea	315-0362-00	Resistor, cmpsn, 3.6kΩ 5% 0.25W
R785	1 ea	315-0472-00	Resistor, cmpsn, 4.7kΩ 5% 0.25W
R733[2]	1 ea	317-0470-00	Resistor, cmpsn, 47Ω 5% 0.125W
R784	1 ea	321-0289-00	Resistor, film, 10kΩ 1% 0.125W
R783	1 ea	321-0324-00	Resistor, film, 23.2kΩ 1% 0.125W

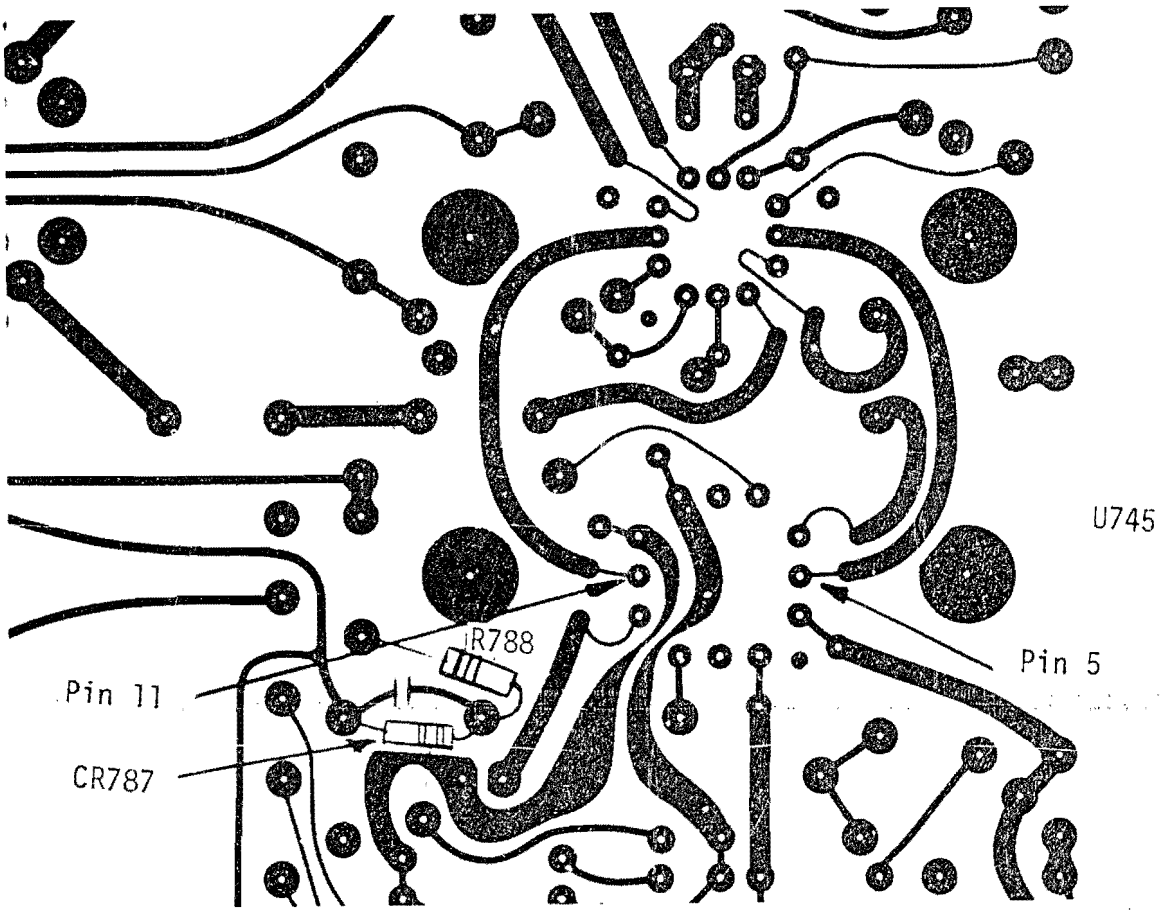


FIG. 1

[1]Circuit numbers for Beam 1 Vertical Amplifier, in the 7844 and R7844, are 1000 and Beam 2 are 2000.

[2]Used in R7903, 7904, and R7912 only.

This modification is divided into two parts. PART I APPLIES TO THE R7903, 7904, & R7912. PART II APPLIES TO THE 7844 & R7844.

FOR PART I SEE FIG. 2 ON PAGE 7.
FOR PART II SEE FIG. 3 ON PAGE 8.

PART I.

INSTRUCTIONS:

Make the following changes on the front of the Vertical Amplifier circuit board:

( ) 1. Replace L667[1], a 1-3μH coil near U685, with the 2-6μH coil from the kit. Cut leads of new coil the same as the old coil before installing.

( ) 2. Drill a #55 hole in the circuit board run that connects to pin 1 of P794[2]. Drill the hole about 3/16 of an inch from P794, install the rivet in the hole and solder it to the run on both sides. Cut the run between pin 1 of P794 and the rivet.

Make the following changes on the back of the Vertical Amplifier circuit board: See drawing. Install the following components on the back of the Vertical Amplifier circuit board as close to the board as possible to provide adequate clearance between components and chassis. See step 13.

( ) 3. Remove R788, a 10kΩ 0.25W resistor (if present) connected between the cathode of CR787 and ground.

( ) 4. Replace CR787, (if present) a diode connected between LR787 and C787, with a piece of bare wire.

( ) 5. Install R733, a 47Ω 0.125W resistor, in parallel with RT731. RT731 is a 50Ω thermal resistor connected to pin 2 of U685.

( ) 6. Install R783 - R784, a 23.2kΩ 0.125W resistor and a 10kΩ 0.125W resistor, connected in series between Pin 1 of P794 and the circuit board board pad as shown in Fig. 2.

Install Q785[3] and Q786 as follows:

( ) 7. Connect collector of Q785 to pin 1 of P794.

( ) 8. Connect emitter of Q785 to rivet installed in step 2.

( ) 9. Connect base of Q785 to the collector of Q786.

( ) 10. Connect base of Q786 to junction of R783 - R784.

[1]This Parts Replacement Kit contains several modifications and the serial number range listed is for the last modification added. No serial number information is given for either part or for an individual step as some steps may have a different serial number than others.

[2]Some R7912 Manuals snow P794 as P700.

[3]See note on page 5 of 8.

( ) 11. Connect emitter of Q786 to one end of R786, a 3.6kΩ 0.25W resistor and connect the other end of R786 to pin 5 of P794.

( ) 12. Install R785, a 4.7kΩ 0.25W resistor, between the collector of Q786 (the base of Q785) and pin 1 of P794.

( ) 13. Temporarily install the Vertical circuit board and check for clearance between all components and the chassis. Reposition parts to assure adequate clearance and re-install the circuit board.

( ) 14. Replace U745 with the new IC from the kit.

( ) Refer to the Recalibration procedure in the Instruction Manual Insert and recalibrate as necessary.

PART II

Note Circuit numbers for Beam 1 Vertical Amplifier are 1000 series and Beam 2 are 2000 series.

INSTRUCTIONS: SEE FIG. 3 on Page 8

Make the following change on the front of the Vertical Amplifier circuit board:

( ) 1. Cut the run between pin 1 of P1782 and pin 1 of P1794. Pin 1 of P1782 is labeled +50V and pin 1 of P1794 is labeled HA.

Make the following changes on the back of the Vertical Amplifier circuit board.

Install the following components on the back of the Vertical Amplifier circuit board as close to the board as possible to provide adequate clearance between components and chassis. See step 12.

( ) 2. Cut the run between pin 1 of P1782 and pin 1 of P1794.

( ) 3. Replace CR1787, (if present) a diode connected between LR1787 and C1787, with a piece of bare wire.

( ) 4. Remove R1788, a 10kΩ 0.25W resistor (if present) connected between the cathode of CR1787 and ground.

Install Q1785[1] and Q1786 as follows:

( ) 5. Connect emitter of Q1785 to pin 1 of P1782.

[1] See note on page 5 of 8.

INSTRUCTIONS CONT'D

( ) 6. Connect collector of Q1785 to pin 1 of P1794. (HA)

( ) 7. Connect base of Q1785 to the collector of Q1786.

( ) 8. Install R1783, a 23.2kΩ 0.125W resistor, between the base of Q1786 and pin 1 of P1794 (HA).

( ) 9. Install R1786, a 3.6kΩ 0.25W resistor, between the emitter of Q1786 and pin 5 of P1794.

( ) 10. Install R1784, a 10kΩ 0.125W resistor, between the base of Q1786 and pin 4 of P1794.

( ) 11. Install R1785, a 4.7kΩ 0.25W resistor, between the base of Q1785 and pin 1 of P1794.

( ) 12. Temporarily install the Vertical circuit board and check for clearance between all components and chassis. Reposition parts to assure adequate clearance and reinstall the circuit board.

( ) 13. Replace U1745 with the new IC from the kit.

Refer to the Recalibration procedure in the Instruction Manual Insert and recalibrate as necessary.

NOTE: Q785 (R7903, 7904 & R7912) or Q1785 & Q2785 (7844 & R7844) will operate when installed with the emitter and collector connections reversed. Proper operation can be verified by determining that the voltage at P780 (R7903, 7904 & R7912) or P1782 & P2782 is approximately 48.7 volts. If the device is installed backwards the output voltage will be about 41 volts.

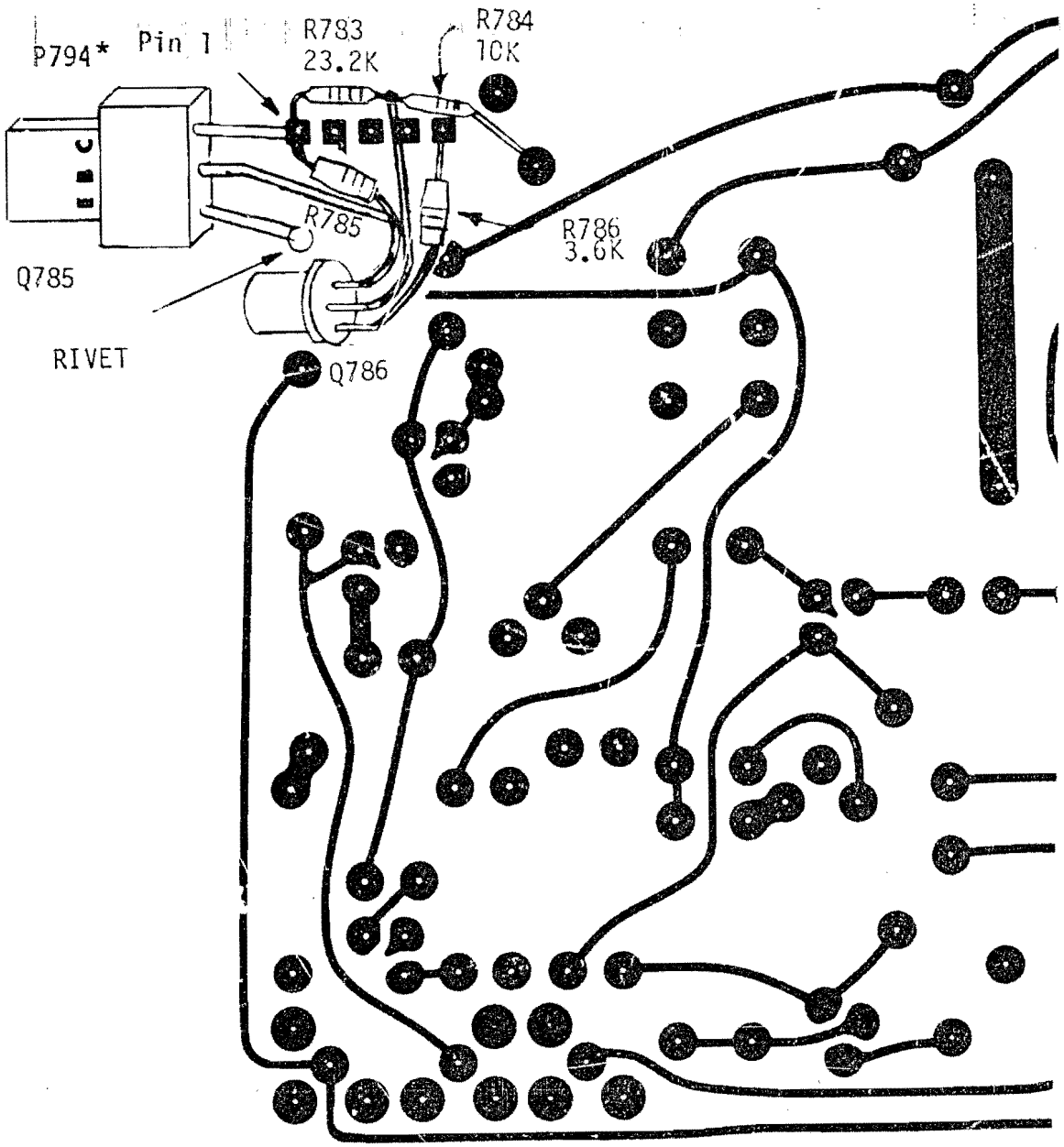


FIGURE 2

* Some R7912 Manuals show P794 as P700.

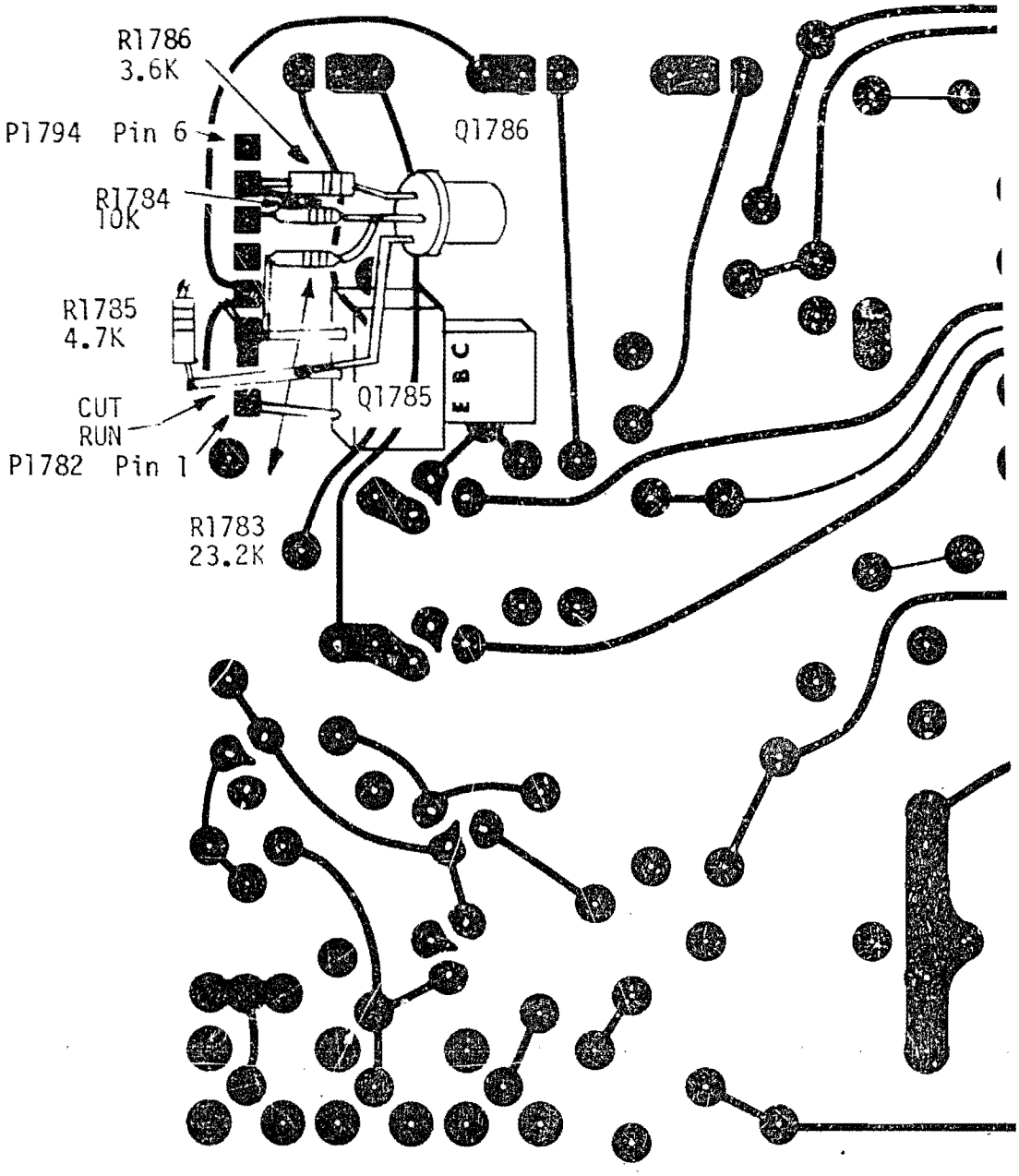


FIGURE 3

INSTRUCTION MANUAL

MODIFICATION INSERT

U745* IC REPLACEMENT

Type 7844 Serial Numbers B010100 - B040233
Type R7844 Serial Numbers B010100 - B030136
Type R7903 Serial Numbers B010100 - B100367
Type 7904 Serial Numbers B010100 - B154159
Type R7912 Serial Numbers B01010C - B090341

Installed in Type _____ SN _____ Date _____

This modification insert is provided to supplement the Instruction Manual for the above listed products. The information given in this insert supersedes that given in the Manual.

GENERAL INFORMATION

This Parts Replacement Kit includes kit, pn 050-0651-XX (a 155-0065-00 IC with selected resistors), and additional selected components necessary to compensate for the increased frequency response of the 155-0065-XX IC.

*Except 7844/R7844. Beam 1 IC is U1745 and Beam 2 is U2745.

REPLACEABLE ELECTRICAL PARTS:

The values of R741 and *R756 are selected to match the Code number as shown below:

U745

Code No.	Resistors	Part Number
1	110Ω	317-0111-00
2	130Ω	317-0131-00
3	160Ω	317-0161-00
4	220Ω	317-0221-00
5	300Ω	317-0301-00
6	510Ω	317-0511-00
7	1000Ω	317-0102-00

Capacitors

C736**	283-0160-00	1.5pF

Inductors

L667	114-0222-00	2-6μH

Resistors

R733	317-0470-00	47Ω	0.125W	5%
R736**	317-0101-00	100Ω	0.125W	5%
R783	321-0324-00	23.2K	0.125W	1%
R784	321-0289-00	10K	0.125W	1%
R785	315-0472-00	4.7K	0.25W	5%
R786	315-0362-00	3.6K	0.25W	5%

TRANSISTORS

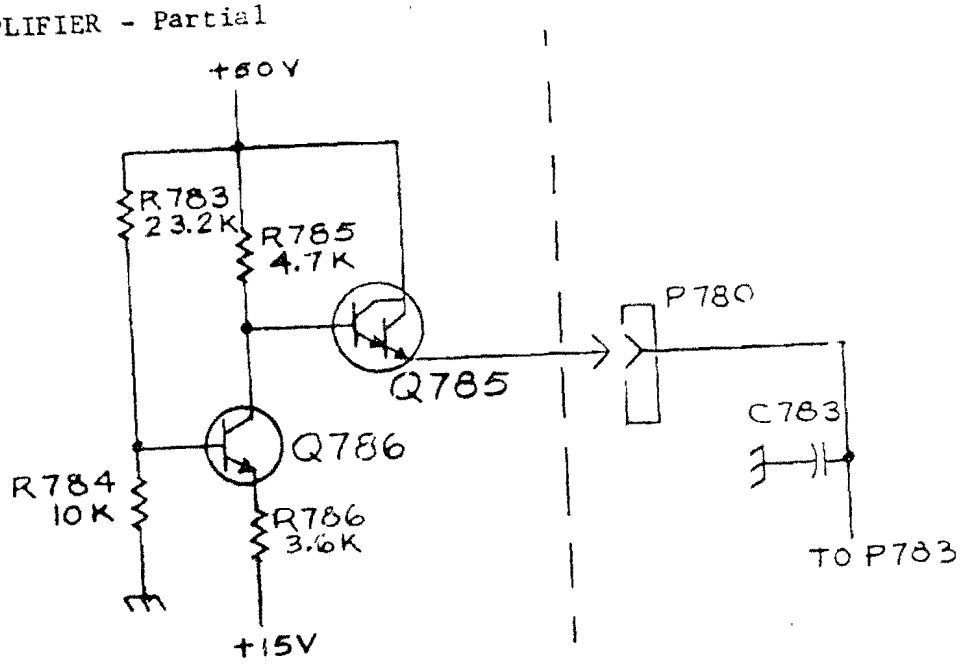
Q785	151-0390-00
Q786	151-0126-00

* Circuit numbers for Beam 1 Vertical Amplifier, in the 7844/R7844 are 1000 and Beam 2 are 2000.

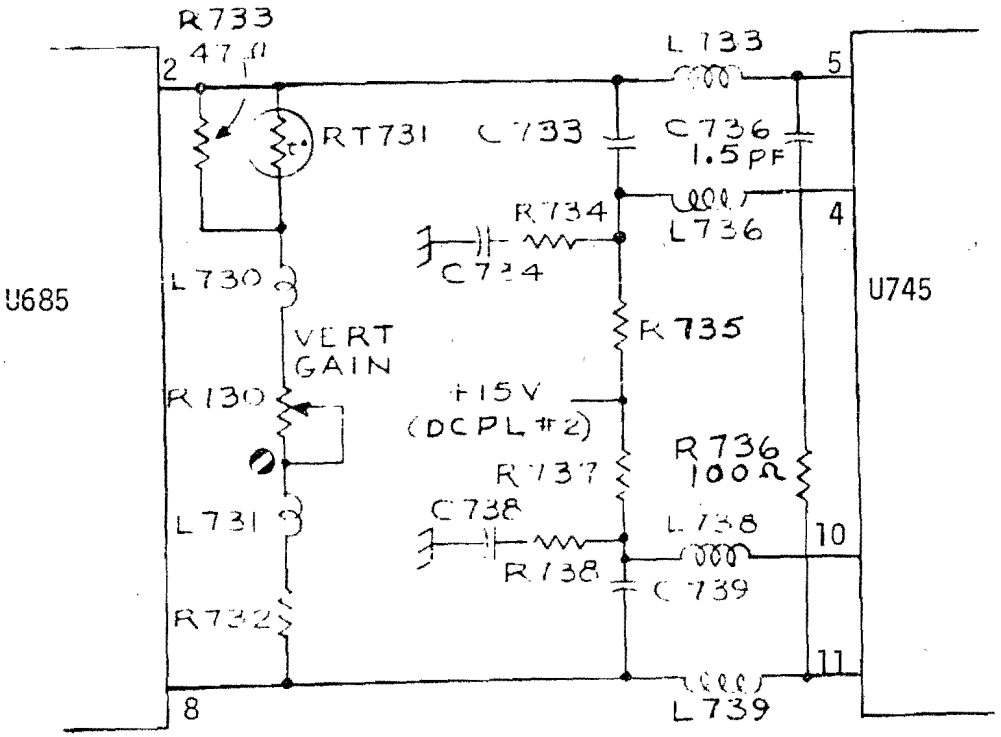
** Test selected components with nominal values of 1.5pF and 100Ω. These components are used in the R7903, 7904 and R7912 only.

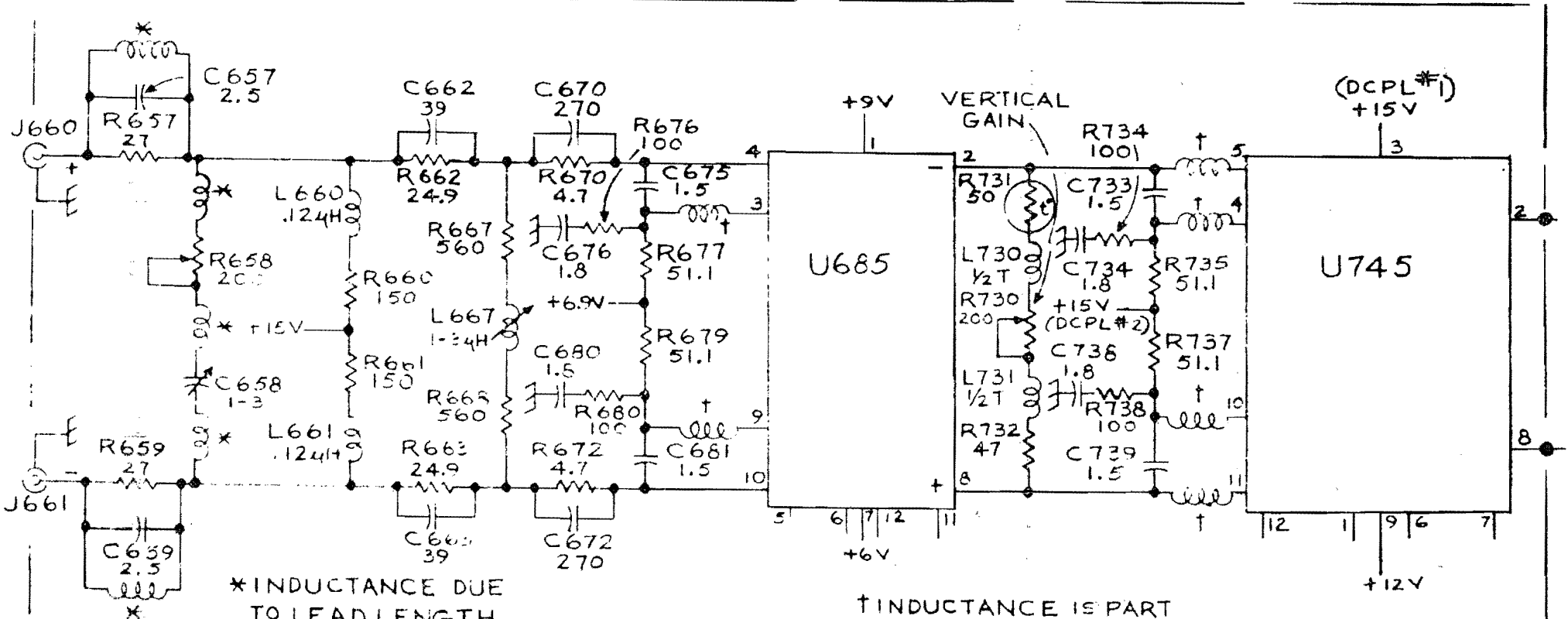
Partial - VERTICAL AMPLIFIER

VERTICAL AMPLIFIER - Partial



Partial - VERTICAL AMPLIFIER





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PARTIAL – VERTICAL AMPLIFIER