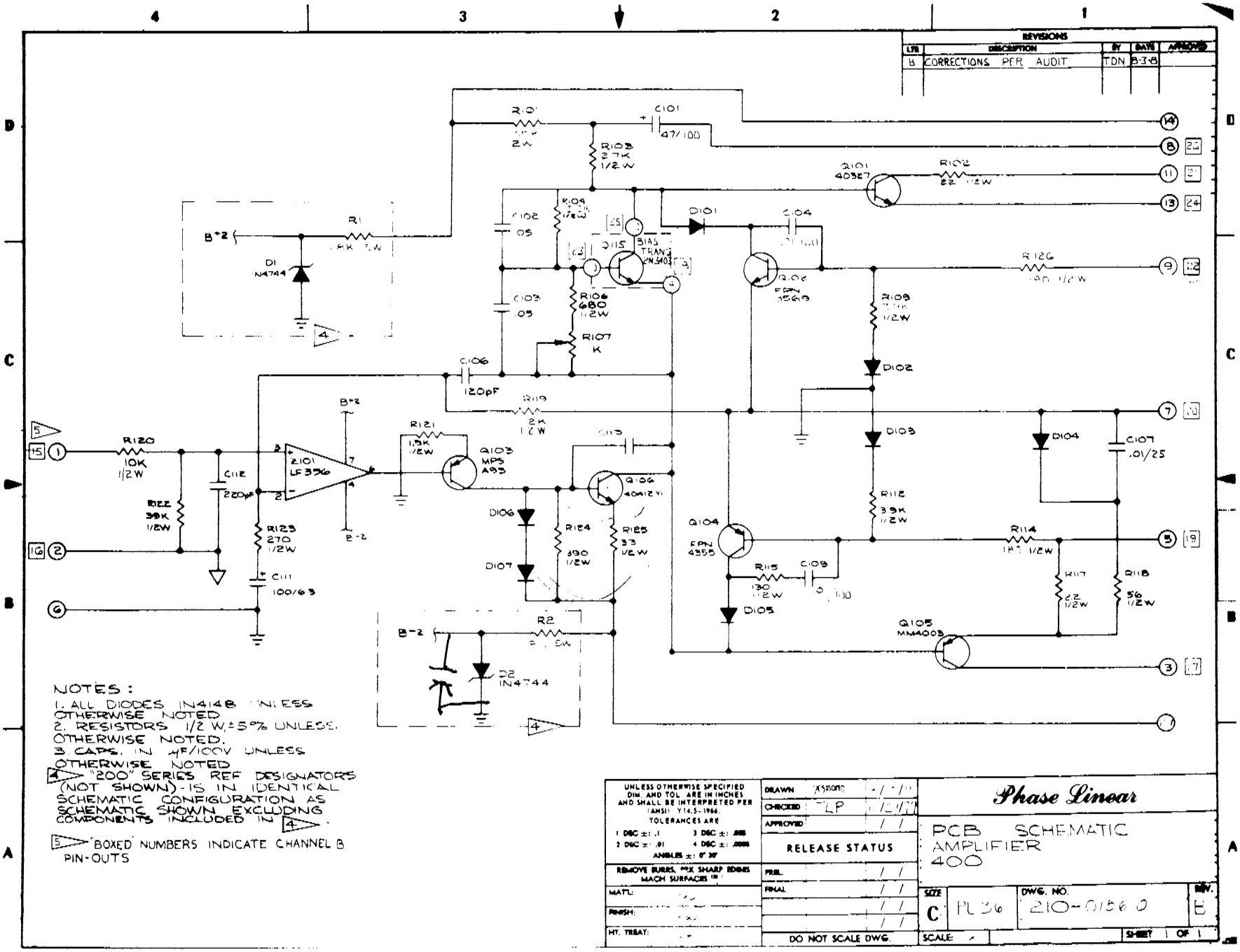


Diagram 2-1. Schematic: PL36, Main PCB.

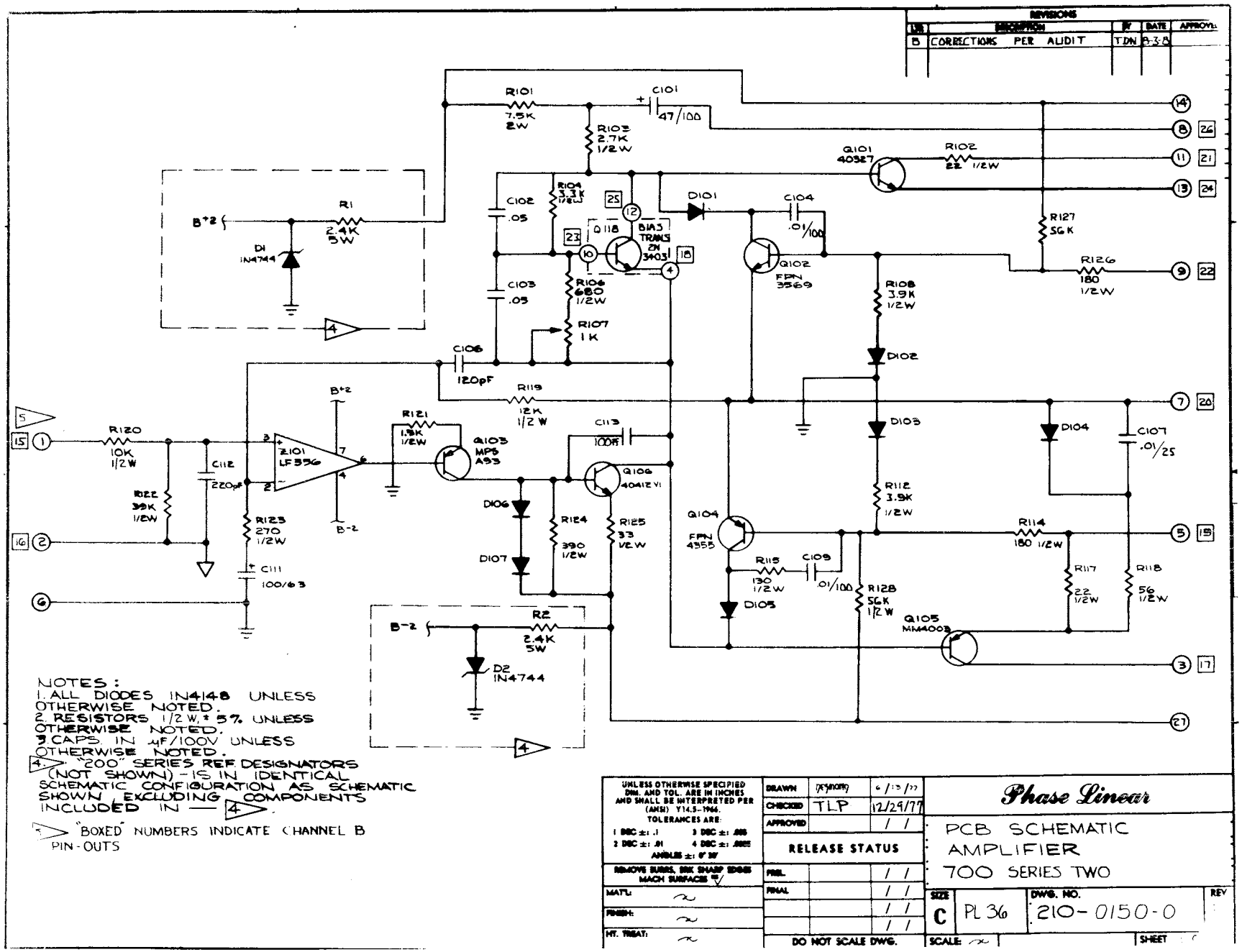


Diagram 2-1. Schematic: PL36, Main PCB

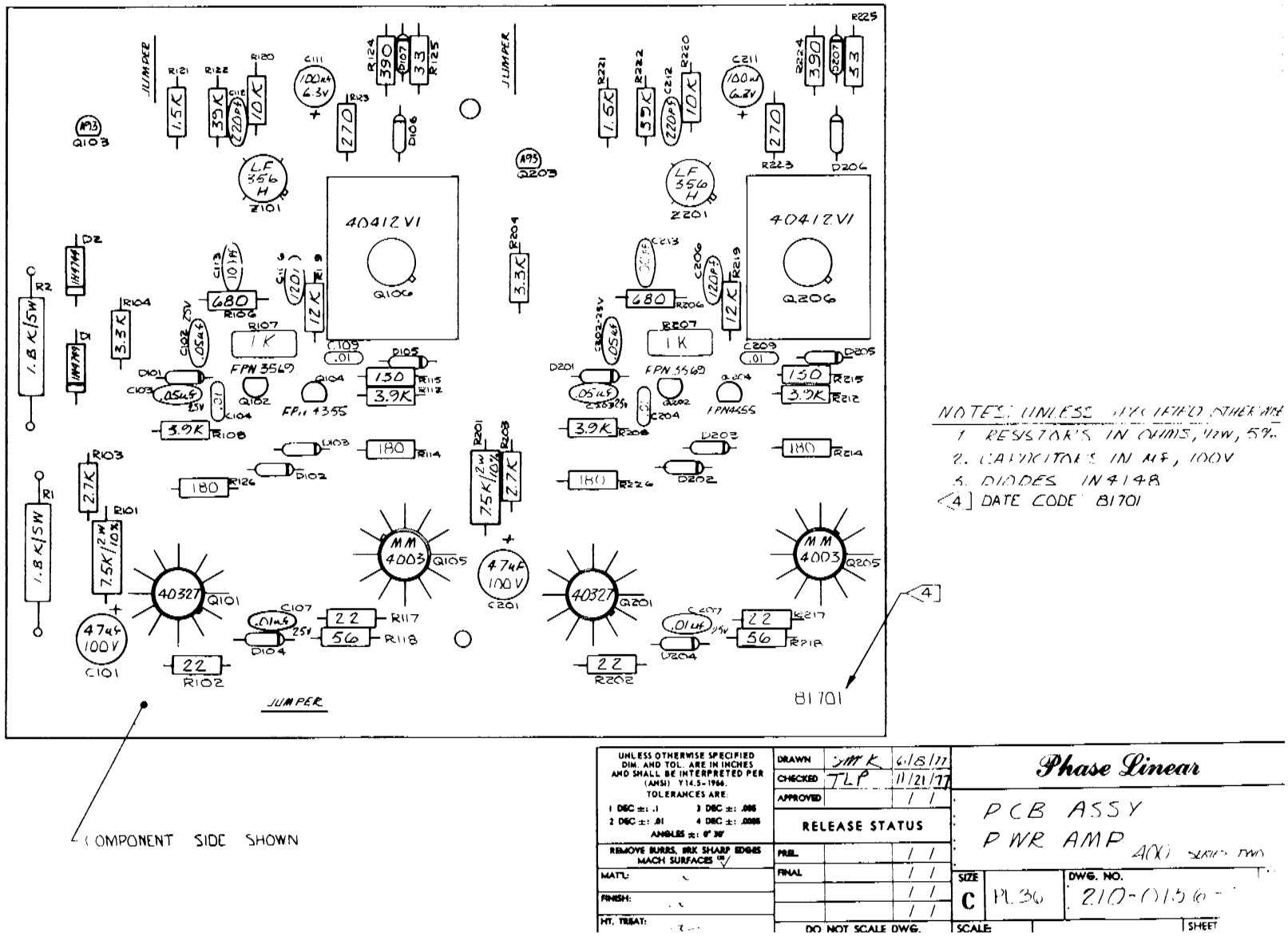


Diagram 2-2. Layout: PL36, Main PCB

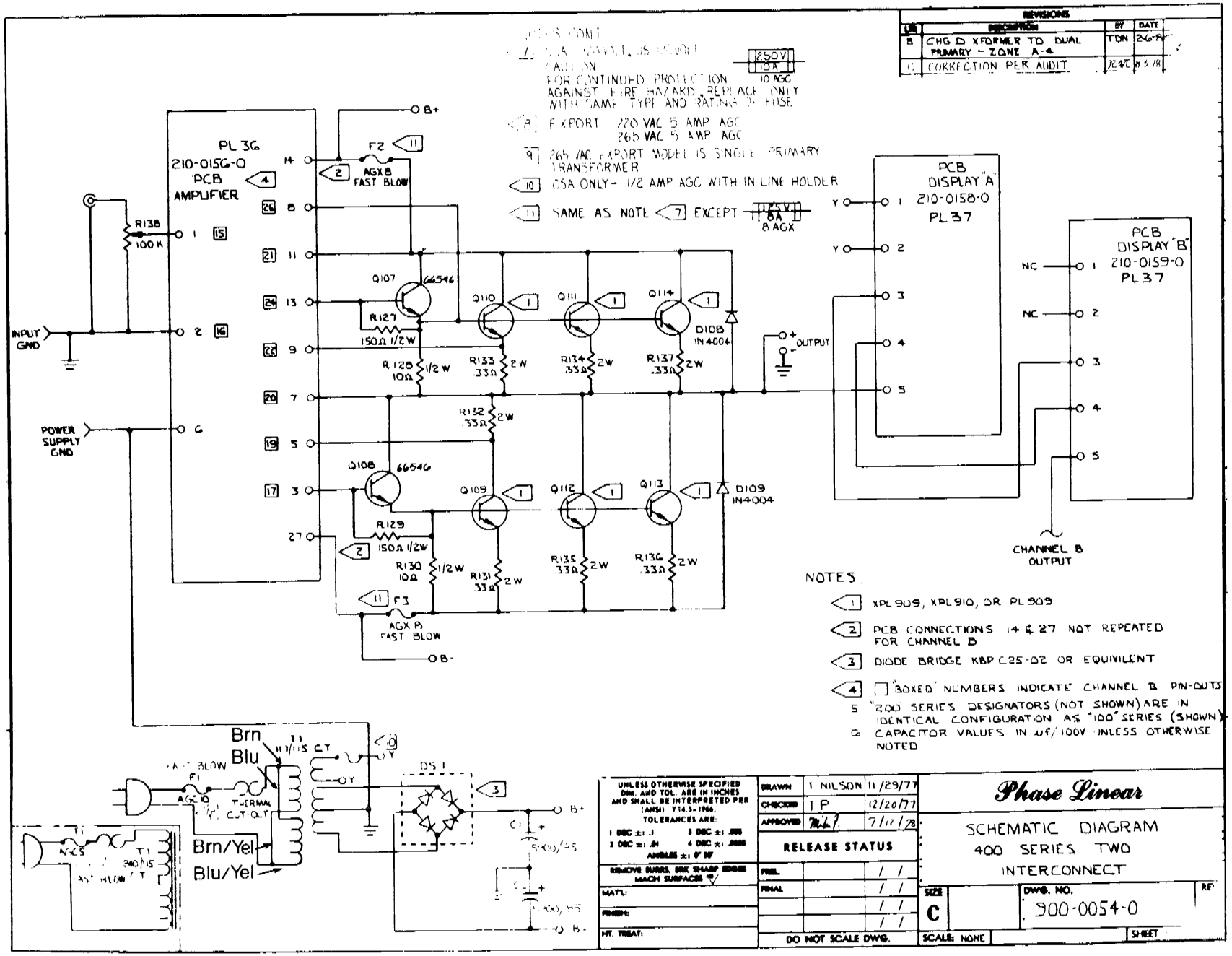
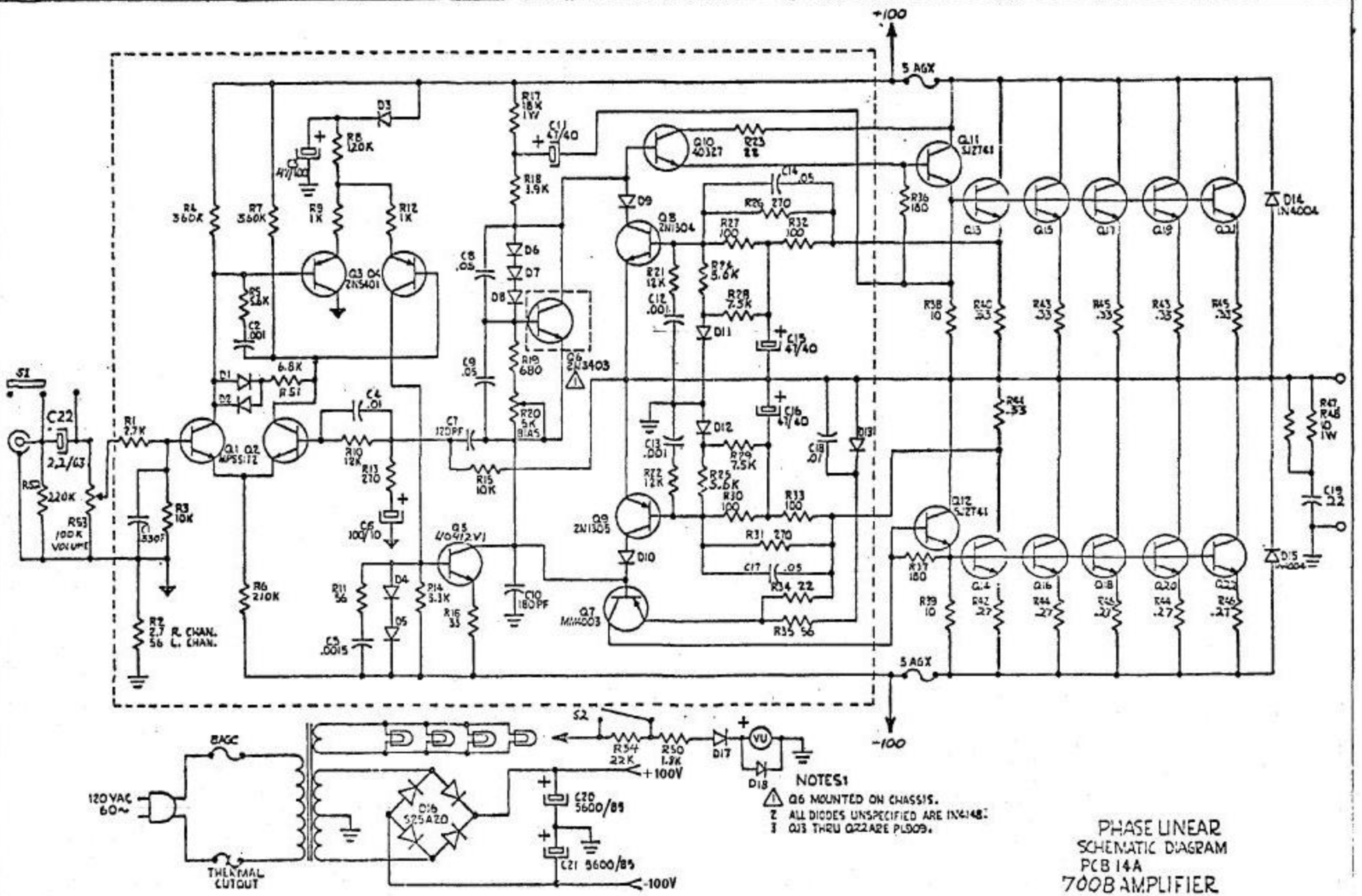


Diagram 2-7. Interconnect schematic.



NOTES:

1. Q6 MOUNTED ON CHASSIS.
2. ALL DIODES UNSPECIFIED ARE IN4148.
3. Q13 THRU Q22 ARE PL509.

PHASE LINEAR
SCHEMATIC DIAGRAM
PCB 14A
700B AMPLIFIER

Phase Linear

20121 - 48th Avenue West, LYNNWOOD, WASHINGTON 98036 U.S.A. Telephone: (206) 774-3571

SERVICE BULLETIN 1-80

IMPORTANT!! ALL PHASE LINEAR PRODUCT SERVICING PERSONNEL PLEASE READ...

SUBJECT: Models 400 Series, 700 Series, and D-500 amplifier output transistors and output driver transistors.

Since Phase Linear amplifiers began production several years ago we have incorporated several different types of output transistors and a few variations on output driver transistors. *Only* those which we have used in the past have been tested and approved by our engineering department for use in Phase Linear amplifiers. It is very important that ALL OUTPUT TRANSISTORS USED IN PHASE LINEAR AMPLIFIERS BE THE SAME IN EACH CHANNEL, that is, they must match by make and device number. Mixing output transistors in the same channel will adversely affect performance, reliability, and/or thermal stability. Therefore when replacing defective output transistors be sure to use only the same make and number used in that particular channel.

The following is a list of output transistors used in the past and their disposition. *Only* these devices have been approved for use in any of the 400 or 700 series amplifiers. Do not attempt to cross-reference these devices to another type of output transistor (2N, Sylvania ECG, etc.) since in the past the use of these devices has resulted in various kinds of amplifier malfunctions or direct failures. Also notice that the model Series Two D-500 uses *only one type* of output transistor (TP9054).

TP9054 (Motorola) - used in some production runs of Series Two model 400II and 700II. This is a higher voltage (and subsequently more expensive) device than the other output transistors. The model D-500 uses TP9054's *exclusively;* no other output transistor should be used in this amplifier. TP9054 is our own number stamped on Motorola MJ15024 devices. If MJ15024's are available locally they may be mixed with TP9054's in the same channel; this is one of *only two* exceptions to the mixed output rule (see XPL909).

XPL909 (Delco) - used in original 400's and 700's to the present. Some early XPL909's were marked PL909 and should not be confused with the Fairchild PL909 transistor. Delco PL909's are marked with *blue* ink and should be considered as XPL909 when ordering replacements. XPL909 is our own number stamped on selected Delco DTS411 devices. If DTS411's are available locally they may be mixed with XPL909's in the same channel. This is one of *only two* exceptions to the mixed output rule (see TP9054). XPL909's are no longer used or stocked as replacement parts.

F

PL909 or FPL909 (Fairchild) - notice the 'F' above PL909. This is how the number appears on the device. Do not confuse Fairchild PL909's with early Delco PL909's. All Fairchild PL909's are marked with *black* ink and should be considered as FPL909 when ordering replacements.

XPL910 (Delco) - these are power Darlington devices and are no longer used in production. Be sure not to confuse or mix these with XPL909's since the design markings on both devices are identical.

1B05 (RCA) - this is RCA's number and these should be available locally. They are no longer used in production.

MJ15011 (Motorola) - this is Motorola's number and these should be available locally. They are no longer used in production.

SE230 (Sensitron) - may be found only on very early model 400's. This is Sensitron's number and these may be available locally.

(cont.)

PL909A (Motorola) - notice the 'A' suffix. These may be found only on very early model 400's and possibly an early 700. These were found to have inconsistent reliability traits and should *all* be replaced in the amplifier whether good or defective. See exchange policy below.

2SD555 (NEC) - was never used in production runs of 400 or 700 series but is a suitable replacement transistor and is slightly more expensive than other outputs. These should be available locally.

Exchange Policy. Since some of the approved output devices have been dropped from our production runs and others are no longer stocked it may be necessary to replace all of the output transistors in one channel of an amplifier if duplicate replacements are not available.

We will be glad to exchange good (non-defective) output transistors for what we have currently available in stock at no charge *providing that* there be included with the transistors returned a note or letter stating the reason for the return and that the transistors being returned are not defective. Also you may wish to state a preference for which devices you would like to receive as replacements, though we cannot always honor your request since we are limited to what we have in stock at the time. Due to the higher cost, TP9054 or 2SD555 devices cannot be sent as direct replacements.

Output Drivers,. We have used only two types of output drivers in the past though three different types may be used (see below). The output driver is the *bottom* transistor in each of the output banks of the amplifier. OUTPUT DRIVERS MUST NOT BE USED AS OUTPUT TRANSISTOR SUBSTITUTES AND VICE VERSA. Output drivers *may* be mixed in the same channel without adversely affecting performance or reliability.

66546 (RCA) - this is our own number stamped on RCA 410 devices which may be available locally.

SJ2741 (Motorola) - found on early model 400's and 700 series amplifiers. May also be listed by Motorola as MJ2741 and should be available locally.

MJ1800 (Motorola) - standard Motorola number and should be available locally.

SPECIAL NOTE

We occasionally receive comments from field technicians that our output transistors read "leaky" on transistors testers and therefore cannot be used in a Phase Linear amplifier. Our engineering department has determined that due to the low gain/high current characteristics of these devices, standard transistor testers are *totaly invalid* in checking for bad outputs in this application.

The only valid test we have found is an in-circuit operational test with the amplifier on and loaded. This test procedure can be found in any of the amplifier service manuals in the Troubleshooting Guide section under "Current Sharing Test" or "Operational Output Transistor Test".