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Rockwell International

October 1, 1982

CHANGE 1
TO
KWM-380/HF-380 SERVICE BULLETIN NO 9

Attached is a revised issue of KWM-380/HF-380 Service Bulletin No 9 titled, "Stop PA Oscillations and Adjust Circuit Gain," dated 2 January 1981.

This revision makes the following changes:

1. Page 1, serial number effectivity table: TBD is replaced by serial numbers.

2. Pages 9/10: Figure 1, sheet 3, was revised to show the correct circuit connections of transformers A1A1T2 and A1A1T3.

Black bars in the margin indicate the location of the changes. This revised issue replaces the entire original publication.

● 350510

KWM-380 TRANSCEIVER (622-5093-001, -101)
HF-380 TRANSCEIVER (622-3580-001, -101)
POWER AMPLIFIER/HEAT SINK ASSEMBLY A1 (634-8481-003)
POWER AMPLIFIER CIRCUIT CARD ASSEMBLY A1A1 (638-6775-001)

SERVICE BULLETIN NO 9

STOP PA OSCILLATIONS AND ADJUST CIRCUIT GAIN

This service bulletin applies to the following:

EQUIPMENT	APPLICABLE TO SERIAL NUMBER	PRODUCTION CUT-IN SERIAL NUMBER
KWM-380		
622-5093-001, -101		
634-8481-003	500 and below, 508	501 through 507, 509 and above
638-6775-001	484 and below, 486 through 489, 491, 498, and 500	485, 490, 492 through 497, 499, 501 and above
HF-380		
622-3580-001, -101		
634-8481-003	35 and below, 37, 38, 39, 41, 42, and 44	36, 40, 43, 45 and above
638-6775-001	50 and below, 52	51, 53 and above
Production cut-in for power amplifier assembly A1 (634-8481-003) is REV G. Production cut-in for power amplifier circuit card assembly A1A1 (638-6775-001) is REV N.		

The purpose of this service bulletin is as follows:

1. Power amplifier oscillations at 0.5 MHz are stopped by adding feedback. The oscillations can be detected by observing higher than normal reflected power when transmitting into an antenna on 21- or 28-MHz bands.

2. Power amplifier oscillations at miscellaneous frequencies, due to high vswr, are stopped by making miscellaneous component changes.

3. Circuit gain can vary due to transistor parameter variations between vendors. This problem is solved by selecting the value of resistor R7 to match the selected vendor for Q41 at time of installation.

Estimated time required is 4.0 man-hours.

The modification parts are itemized in the material information paragraph. For information concerning parts, contact Collins Service Center, Rockwell International, 6001 Threadgill Avenue, El Paso, Texas 79924. Reference KWM-380/HF-380 Service Bulletin No 9 in all correspondence.

No special tools or equipment are required.

This service bulletin references the KWM-380, CPN 523-0769878, and HF-380, CPN 523-0769880, service manuals.

MODIFICATION PROCEDURE

A. Turn off all power to the transceiver.

B. Remove the dust cover by removing the four screws located adjacent to the four feet on the bottom of the transceiver.

C. Remove power amplifier/heat sink assembly A1 by removing three screws on each side of the heat sink. Refer to the service manual overall unit section, figure 7.

D. Remove the metal cover from power amplifier circuit card assembly A1A1. Refer to the service manual chassis/power supply A9 and front panel A10 section, figure 3, item 1.

NOTE: Do not remove circuit card A1A1 from power amplifier/heat sink assembly A1. Refer to figure 1 while performing steps E through T. Refer to figure 2 for a schematic diagram of the latest configuration.

E. Remove 1500-pF capacitor C55 by cutting the leads close to the body of the component. Leave the capacitor leads soldered into the circuit card.

F. Install a 1000-pF capacitor (912-3315-000), connecting the leads to the leads of the capacitor removed in step E.

G. Install a 2.7-μH coil L44 (240-2715-180) as shown in figure 1, detail A.

H. Remove 0.27-μH inductors L23 and L24 by cutting the leads close to the component body. Leave the inductor leads soldered into the circuit card.

I. Install two 3.3-μH inductors (240-2029-000), connecting the leads to the leads of the inductors removed in step H.

J. Install 100-Ω resistor R123 (745-1310-000) in parallel with L23. Wrap the resistor leads around the coil leads and solder.

K. Install 100-Ω resistor R124 (745-1310-000) in parallel with L24. Wrap the resistor leads around the coil leads and solder.

L. Examine transistors Q41A/B and resistor R7. If Q41 was manufactured by Motorola, the value of R7 should be 15 Ω. If Q41 was manufactured by CTC, the value of R7 should be 27 Ω. If it is necessary to replace R7, cut the resistor leads close to component body, leaving the leads soldered into the circuit card. Install the new resistor (15 Ω, 745-0683-000, or 27 Ω, 745-0692-000), attaching the leads to the old resistor leads.

M. Install a wire (421-2020-000) in parallel with resistor R23. Wrap the ends of the wire around the R23 leads and solder.

N. Install a wire (421-2020-000) in parallel with resistor R24. Wrap the ends of the wire around the R24 leads and solder.

O. Remove 40.2-kΩ resistor R93 by cutting the leads close to the body of the component. Leave the leads soldered into the circuit card.

P. Install a 44.2-kΩ resistor (705-1075-000) attaching the leads to the leads of the resistor removed in step O.

Q. Remove and discard 68-Ω resistor R116.

R. Install electronic components assembly A1A2 (647-2781-001) onto the circuit card as shown in figure 1 using the existing hardware.

S. Wind two turns of brown wire (422-0795-000) in transformer T3 as shown in figure 1, detail B. Connect to A1A2 assembly as shown in figure 1, detail D. If the transformer core has potting in the holes, carefully clear a way for the brown wire, using a stiff wire such as a straightened paper clip.

T. Wind two turns of red wire (442-0796-000) in transformer T2 as shown in figure 1, detail D. If necessary, clear the core of potting as in step S.

NOTE: The added wires in steps S and T must be oriented as shown in figure 1, details B and C, to prevent oscillation.

U. Reassemble the transceiver in the reverse order of disassembly.

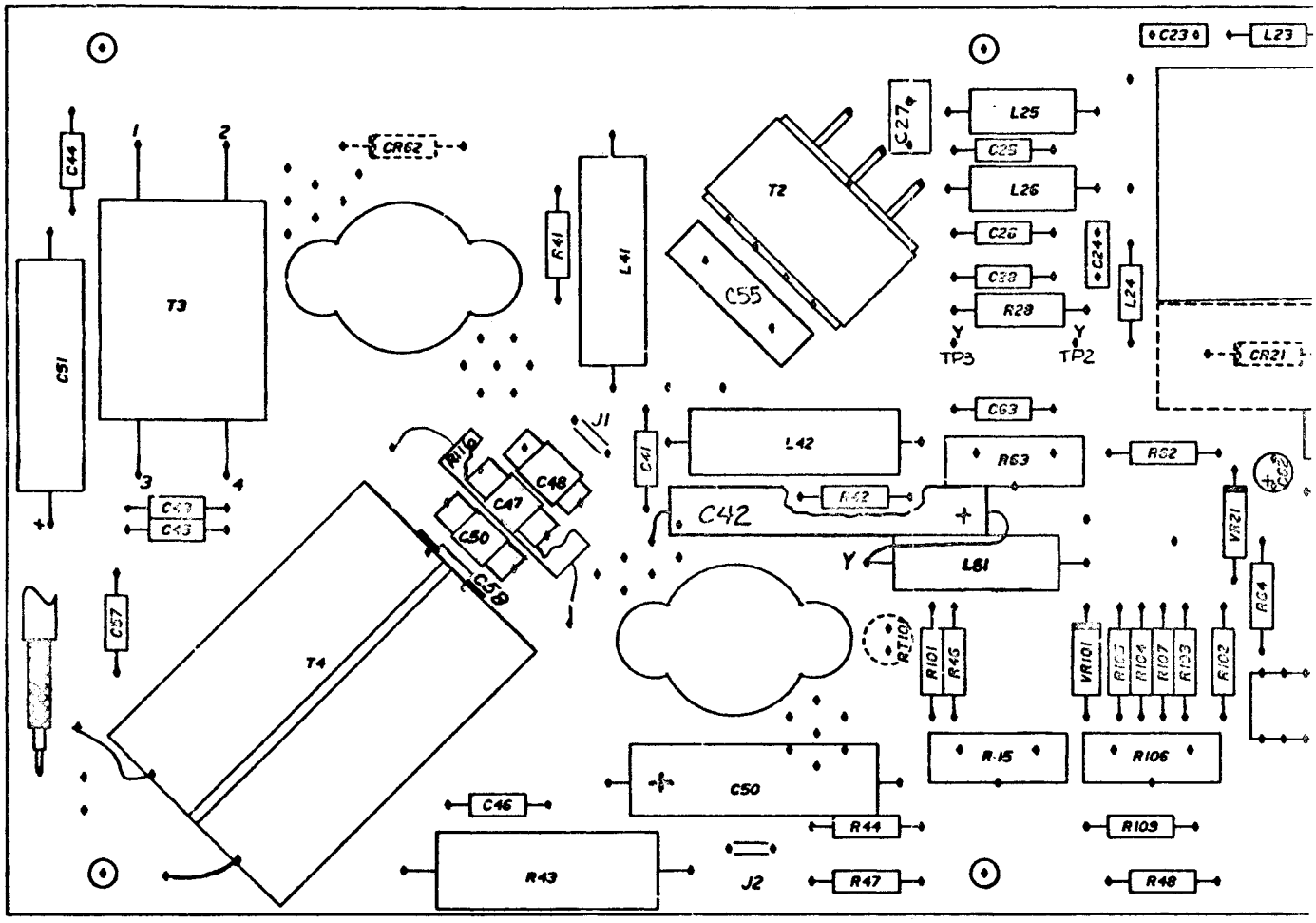
V. Mark SB 9 on the service bulletin information chart. If the transceiver does not have an information chart, install a chart (280-3778-010) near the nameplate.

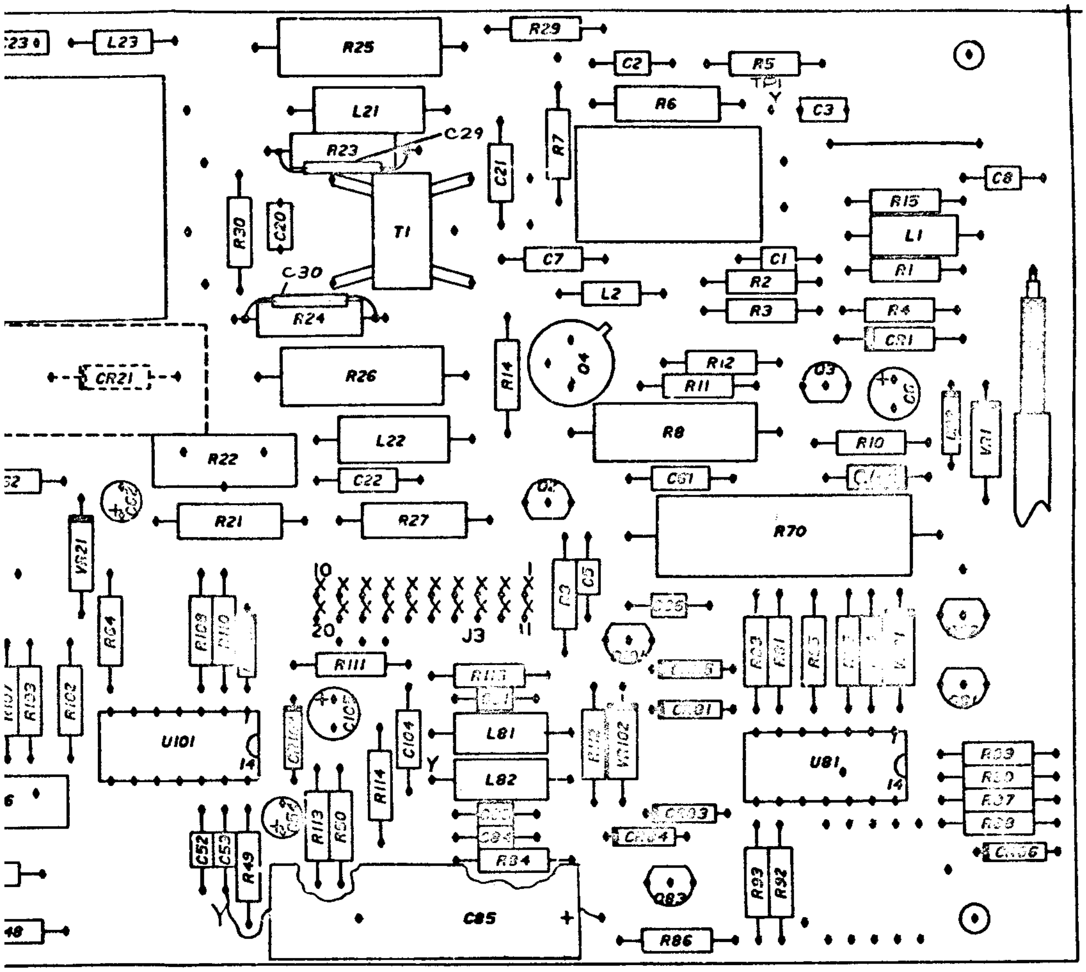
MATERIAL INFORMATION

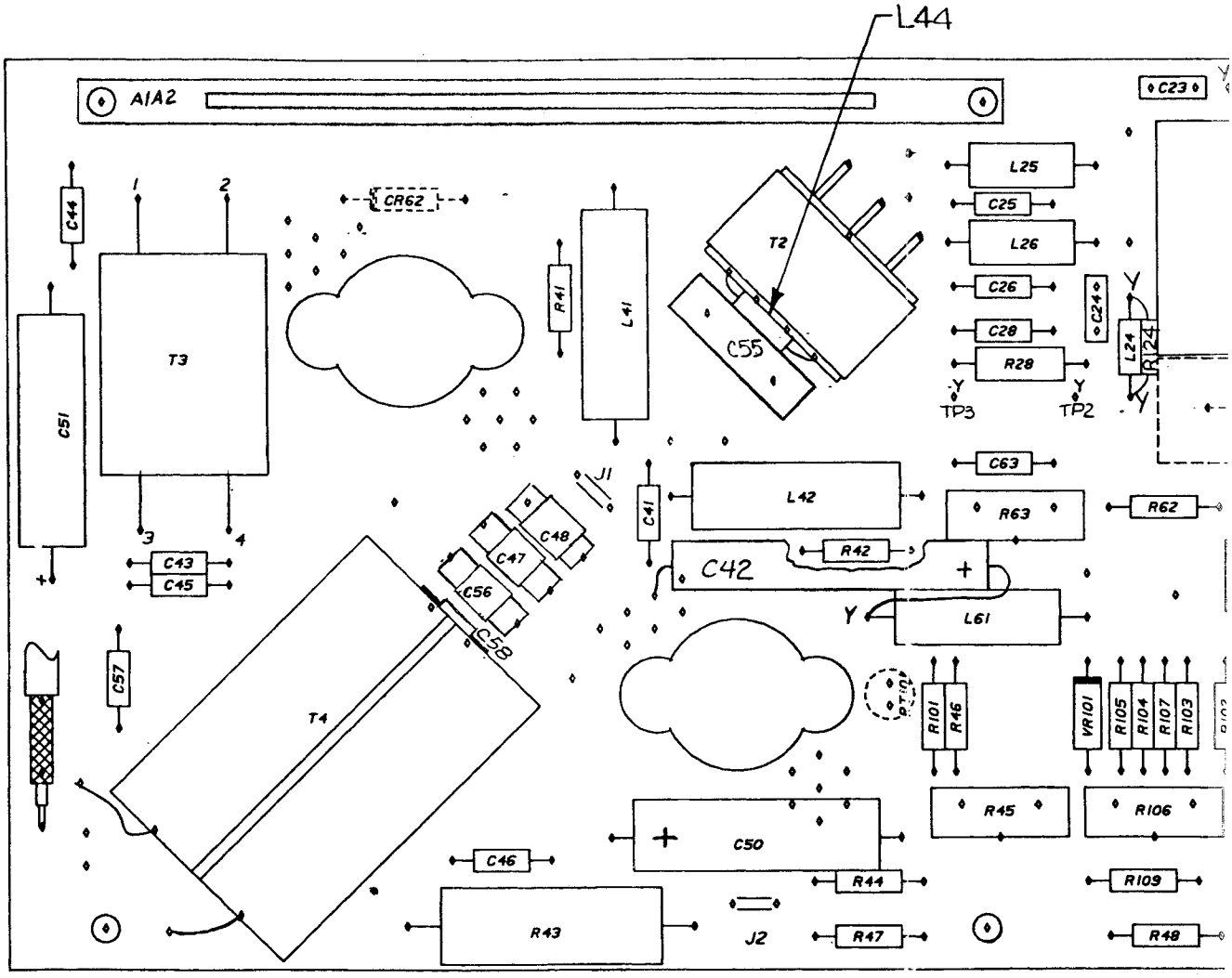
The parts listed below are required to modify one KWM-380 or one HF-380.

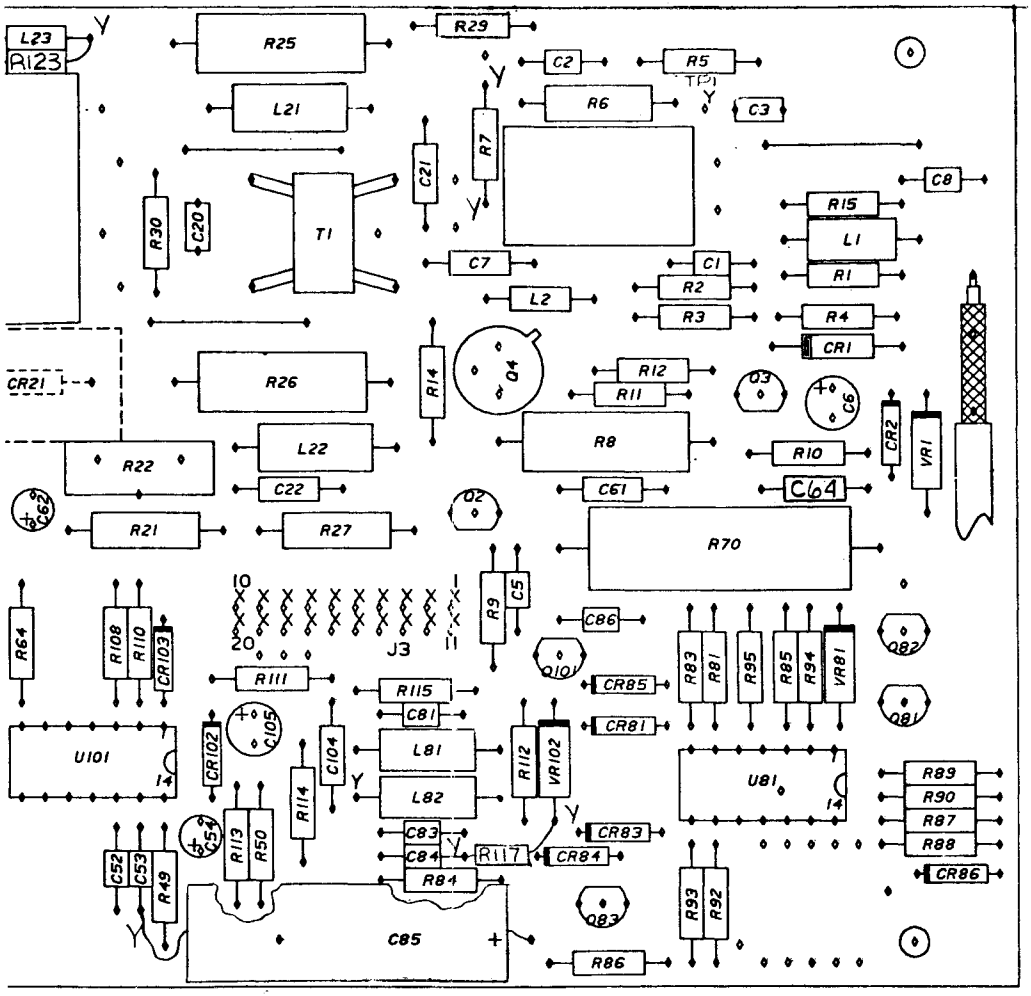
COLLINS PART NUMBER	QTY	UNIT PRICE	DESCRIPTION
912-3315-000	1		Capacitor, 1000 pF, C55
240-2715-180	1		Coil, 2.7 μH, L44
240-2029-000	2		Inductors, 3.3 μH, L23, L24
745-1310-000	2		Resistor, 100 Ω, R123, R124
745-0683-000	1		Resistor, 15 Ω, R7
745-0692-000	1		Resistor, 27 Ω, R7
421-2020-000	75 mm (3 in)		Wire, #20 AWG, bus
705-1075-000	1		Resistor, 44.2 kΩ, R93
647-2781-001	1		Assembly, electronic components, A1A2
422-0795-000	250 mm (10 in)		Wire, A26TA00X1XXX
422-0796-000	250 mm (10 in)		Wire, A26TA00X2XXX
*280-3778-010	1		Chart, information

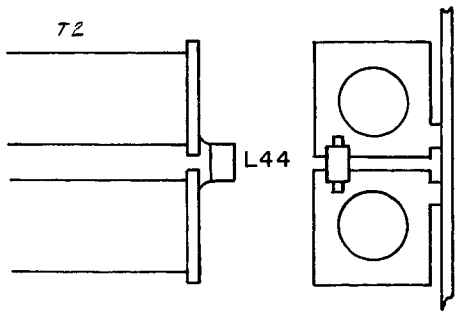
*Order if needed.


C23
L23
C44
1
2
CR62
T3
C51
R41
L41
T2
C27
L25
C25
L26
C26
C24
C38
L24
R28
C55
TP3
TP2
CR21
C43
C48
C47
C50
C58
J1
L42
C41
C63
R63
R62
C42
R42
L61
Y
VR21
R64
C57
T4
R101
R45
RT10
VR101
R102
R105
R106
R107
R103
R-15
R106
C46
C50
R44
R109
R43
J2
R47
R48

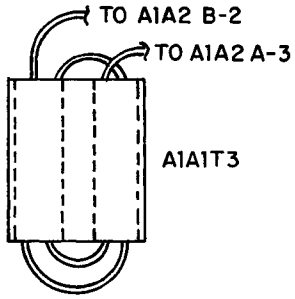

L23
R25
R29
C2
R5
C3
L21
C29
R23
R6
R7
C21
C8
R30
C20
T1
R15
L1
C7
C1
R1
C30
L2
R2
R24
R3
R4
CR1
CR21
R26
R14
Q4
R12
Q3
R11
L22
R8
R22
R10
VR1
C22
C61
R21
R27
R70
VR21
R64
J3
R109
R111
R102
U101
C104
L81
L82
U81
R114
R113
C52
C53
R49
R84
C85
Q83
R93
R92
R86


L44
A1A2
C23
L25
C25
L26
C26
C28
R28
C24
L24
R124
TP3
TP2
C44
CR62
T2
T3
C55
R41
L41
C51
J1
C41
L42
C63
R63
R62
C43
C45
C48
C47
C56
C58
R42
C42
L61
C57
T4
R101
R46
VR101
R105
R104
R107
R103
R45
R106
C50
C46
R44
R109
R43
J2
R47
R48

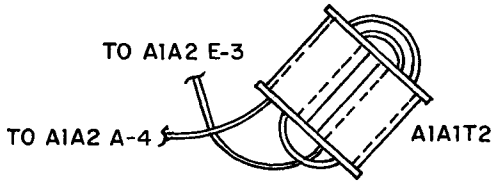

L23
R123
R25
R29
C2
R5
TP1
L21
R6
C3
R7
C21
C8
R30
C20
T1
R15
L1
C7
C1
R1
R2
L2
R3
R4
CR1
CR21
R26
R14
Q4
R12
R11
Q3
C6
CR2
VR1
R22
L22
R8
R10
C64
C62
C22
C61
Q2
R21
R27
R70
J3
R9
C5
C86
R64
R108
R110
CR103
Q101
Q82
R83
R81
R95
R85
R94
VR81
R111
R115
CR85
C81
Q81
U101
CR102
C105
L81
CR81
C104
R112
VR102
U81
R89
R90
R87
R88
R114
L82
C54
R113
R50
C83
C84
R117
CR84
CR83
CR86
C52
C53
R49
R84
R93
R92
C85
Q83
R86



DETAIL A

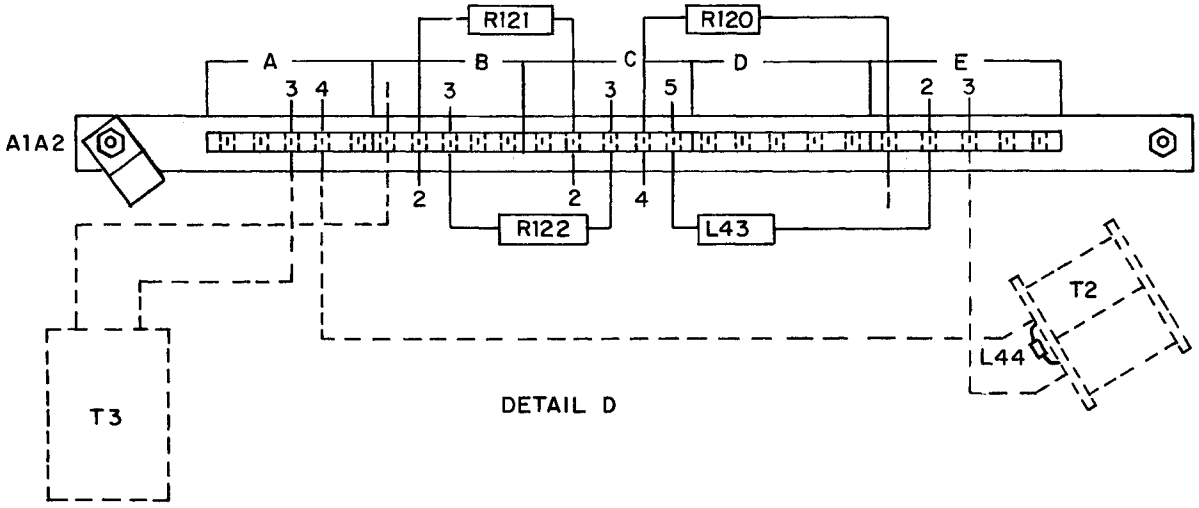


DETAIL B

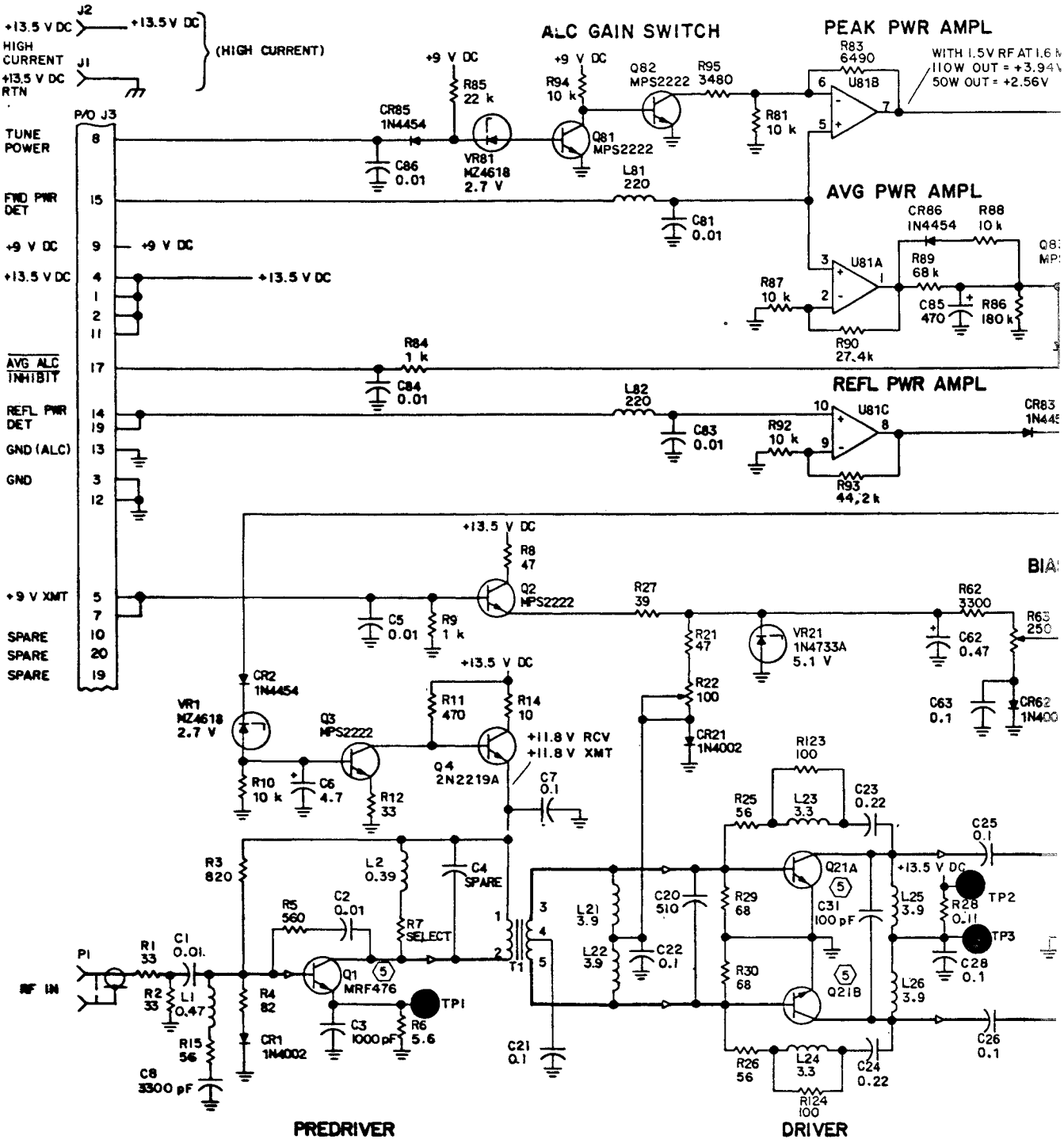


DETAIL C

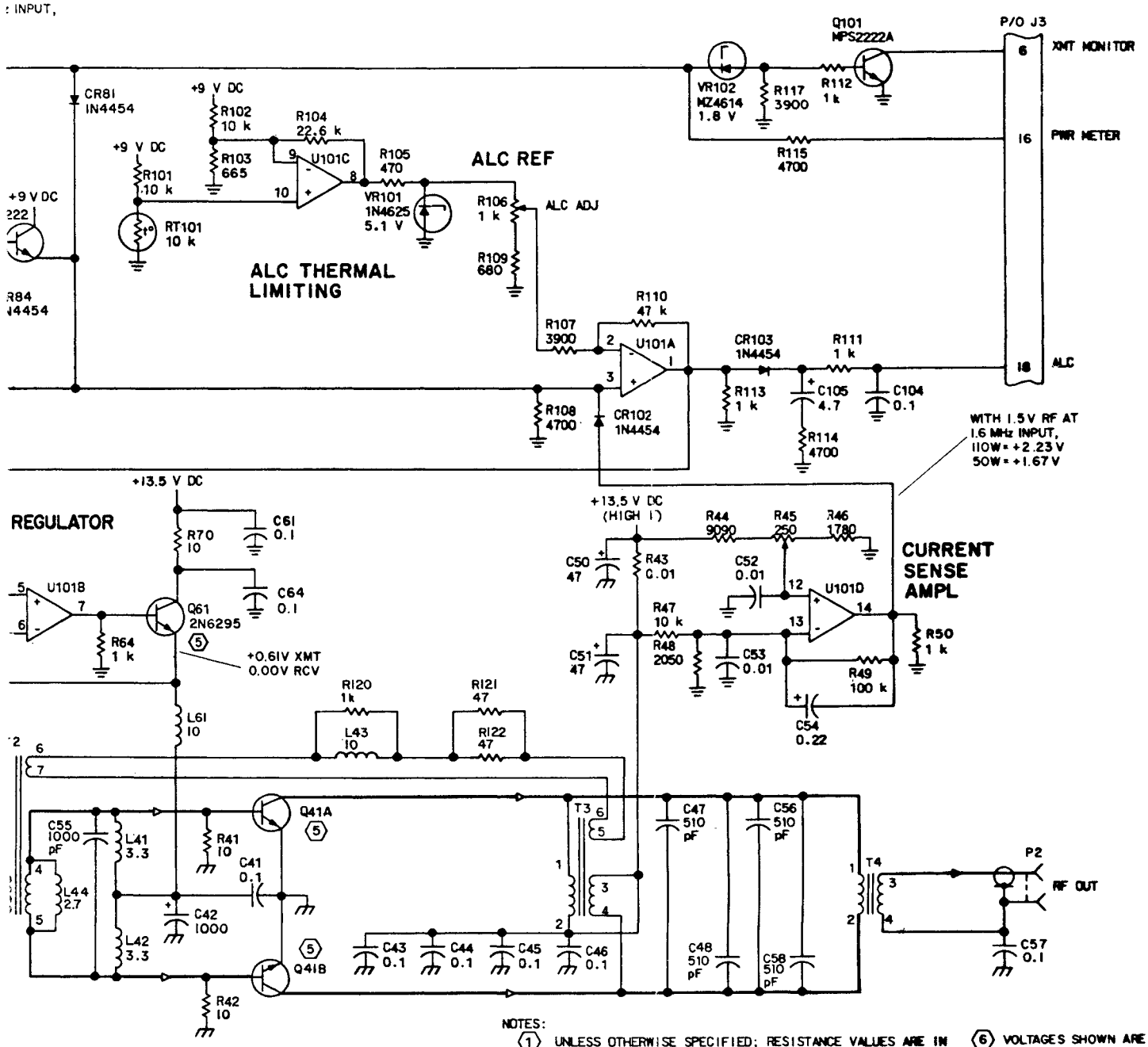
NOTE: LEADS FROM T2 AND T3 MUST BE CAREFULLY POSITIONED AS SHOWN TO PREVENT DESTRUCTIVE OSCILLATION.



DETAIL D


ALC GAIN SWITCH
PEAK PWR AMPL
AVG PWR AMPL
REFL PWR AMPL
PREDRIVER
DRIVER
+13.5 V DC
+9 V DC
HIGH CURRENT
(HIGH CURRENT)
TUNE POWER
FWD PWR DET
AVG ALC INHIBIT
REFL PWR DET
GND (ALC)
GND
+9 V XMT
SPARE
RF IN
+11.8 V RCV
+11.8 V XMT
MRF476
MPS2222
2N2219A
1N4454
1N4002
1N4733A
MZ4618
2.7 V
5.1 V
U81A
U81B
U81C
Q21A
Q21B
TP1
TP2
TP3
T1
SELECT
WITH 1.5V RF AT 1.6 M
110W OUT = +3.94 V
50W OUT = +2.56V

POWER AMPLIFIER A4 (638-6775-001)



NOTES:

1. UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS AND INDUCTANCE VALUES ARE IN MICROHENRYS.
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATIONS, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.
3. ON MICROCIRCUITS U81 AND U101, PIN 4 IS +9 V DC AND PIN 11 IS GROUND. BOTH ARE LM324.
4. ——▶ RF PATH
5. Q21A/Q21B AND Q41A/Q41B ARE MATCHED PAIRS AND ARE MOUNTED ON POWER AMPLIFIER HEAT SINK. Q1 AND Q61 ARE MOUNTED ON POWER AMPLIFIER HEAT SINK.
6. VOLTAGES SHOWN ARE NOMINAL.

634-6647