

**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
TDR-94, PART NO 622-9352

STEP	PROCEDURE	DESIRED RESULTS
1.21	Verify that no fault codes are indicated on the monitor in either the "F3" CSDB output word or in the "350" ARINC-429 Maintenance Data Output word.	
1.22	If the UUT fails the Mode-S_Only reply rate as specified in Table 1001/Table 34-50-96-99A-009-A01 step 1.1.A at ambient or during temperature test, first verify the DPSK alignment. If alignment is satisfactory but UUT still fails Table 1001/Table 34-50-96-99A-009-A01 step 1.1.A, replace A7R430 with another value from the test select listing as shown in the associated parts list. Reverify DPSK alignment and complete temperature testing as required.	
1.23	After alignment is complete, remove all power from test equipment and reassemble unit under test.	
2.0	Receiver IF/LVPS Assembly, Alignment for CPN 687-0727-005 or subsequent.	
2.1	Monitor the 5 VDC output (J7-26) with a DVM while adjusting A7R507 on the IF/Power Supply board.	5 VDC output adjusted to 4.99 to 5.01 Vdc.
2.2	Monitor J7-33 on the Video Processor board with an oscilloscope.	
2.3	Set the MODE-S Test Set to generate ATCRBS MODE-C interrogations and apply to the bottom antenna connector. Set the interrogation rate to 450/second.	
2.4	<p>a. Set the MODE-S Test Set signal strength for -79 dBm.</p> <p>b. Adjust A7R196 to the fully clock-wise position. Monitor the Bottom Video signal at pin 33 of A6P22 with an oscilloscope while adjusting A7R95.</p> <p><u>NOTE:</u> The oscilloscope must be set to the averaging mode to properly measure the video pulse at the low signal levels required.</p> <p>c. Set the MODE-S test set signal strength to -77 dBm.</p> <p>d. Monitor the Bottom Video signal at pin 33 of A6P22 while adjusting A7R196.</p> <p>e. Verify that the reply rate is between 90% and 100%. If necessary, readjust A7R195 to get the desired result.</p>	<p>An observed video level of 0.7 volts Peak.</p> <p>An observed video level of 0.7 volts Peak.</p> <p>A reply rate between 90% and 100%.</p>
2.5	<p>a. Set the MODE-S Test Set signal strength for -31 dBm.</p> <p>b. Monitor the P1 pulse at J7-33 with a DVM while adjusting A7R179 on the IF-Receiver.</p>	The P1 pulse adjusted to 4.99 to 5.01 V dc.

Alignment Procedure Cont.  
Table 1002/Table 34-50-96-99A-010-A01

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STEP	PROCEDURE	DESIRED RESULTS
2.6	Repeat steps 2.4 and 2.5 as necessary.	
2.7	a. Set the MODE-S Test Set signal strength for -27 dBm. b. Adjust A6R118 on the Video Processor board while monitoring the positive end of A6C67 with the oscilloscope.	The observed ditch-slope waveform resulting from P1 is 16.2±.2 µs wide at its base.
2.8	Steps 2.9 through 2.14 are applicable only to the TDR-94Ds that use the 687-0727-005 Receiver-IF/LVPS. MODE-C interrogations are applied only to the UUT top antenna port for these steps.	
2.9	a. Set the MODE-S Test Set signal strength for -79 dBm. b. Adjust A7R195 to the fully clockwise position. c. Monitor the Top Video signal at pin 31 of A6P22 with the oscilloscope with adjusting A7R94.  <u>NOTE:</u> The oscilloscope must be set to the averaging mode to properly measure the video pulse at the low signal levels required.  d. Set the MODE-S Test Set signal strength for -77 dBm. e. Monitor the Top Video signal at pin 31 of A6P22 while adjusting A7R195	An observed video level of 0.7 volts Peak.          An observed video level of 0.7 volts Peak.
2.10	Verify that the reply rate is between 90% and 100%. If necessary, readjust A7R94 to the get the desired result.	A reply rate between 90% and 100%.
2.11	a. Set the MODE-S Test Set signal strength for -31 dBm. b. Monitor the P1 pulse at J7-31 with a DVM whiling adjusting A7R178 on the IF-Receiver.	The P1 pulse adjusted to 4.99 to 5.01 V dc.
2.12	Repeat steps 2.10 and 2.11 as necessary.	
2.13	a. Set the MODE-S Test Set signal strength for -50 dBm. b. Measure and record the amplitude or the P1 pulse at J7-31. c. Apply the same input signal level to the bottom channel. d. Measure and record the amplitude or the P1 pulse at J7-33.	_____ V    _____ V

Alignment Procedure Cont.  
Table 1002/Table 34-50-96-99A-010-A01

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STEP	PROCEDURE	DESIRED RESULTS
2.13 (cont)	<p>e. Verify that the two recorded amplitudes are with .1 V of each other. If necessary, readjust the higher voltage downward with A7R178 or A7R179 (whichever is applicable) until the two voltages are with .1 V of each other.</p> <p><b>NOTE:</b> If readjustment of A7R178 or A7R179 was necessary, then the MTL for the top or bottom channel must also be readjusted in accordance with step 2.4 or 2.10 (whichever is appropriate).</p>	The difference between the two recorded voltages is $0 \pm 0.1$ V.
2.14	<p>a. Set the MODE-S Test Set signal strength for -27 dBm.</p> <p>b. Adjust A6R117 on the Video Processor board while monitoring the positive end of A6C59 with the oscilloscope.</p>	The observed ditch-slope waveform resulting from P1 is $16.2 \pm .2$ $\mu$ s wide at its base.
2.15	<p><b>NOTE:</b> Use extreme care while making the adjustments in steps 2.15 through 2.17. Make the DPSK trimmer capacitor adjustments in very small increments. These adjustments are critical to the performance of the TDR-94/94D.</p> <p>a. To align the DPSK Demodulator VCO, interrogate the bottom channel with MODE-S ONLY ALL-CALL interrogations having a signal strength of -50 dBm.</p> <p>b. Adjust the interrogation center frequency above 1030 MHz until the reply rate decreases to 90%. Record this frequency as the upper limit.</p> <p>c. Adjust the interrogation center frequency below 1030 MHz until the reply rate decreases to 90%. Record this center frequency as the lower frequency limit .</p> <p>d. Adjust A7R223 to a level where the upper and lower frequency limits are equidistant from the 1030 MHz center frequency.</p>	<p>Upper Frequency limit: _____ MHz</p> <p>Lower Frequency limit: _____ MHz</p> <p>The upper frequency limit must not be less than 1030.6 MHz and the lower frequency limit must not be greater than 1029.4 MHz</p>
2.16	<p>a. To align the DPSK 60 MHz BPF interrogate the bottom channel with MODE-S ONLY ALL-CALL interrogations having a signal strength of -70 dBm and a center frequency of 1030.0 MHz.</p> <p>b. Slowly adjust A7C110 while monitoring A7J7-37 with the oscilloscope.</p>	A7C110 is adjusted for the cleanest and most square signal pulses at A7J7-37.

Alignment Procedure Cont.  
Table 1002/Table 34-50-96-99A-010-A01

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STEP	PROCEDURE	DESIRED RESULTS
2.17	<p>a. Set the MODE-S Test Set for a -50 dBm MODE-S ONLY ALL-CALL interrogation signal.</p> <p>b. Inject an interference pulse of 0.80 <math>\mu</math>s duration at a carrier frequency of 1030 MHz, that is incoherent with the interrogation. Set the amplitude of the interference pulse to -3dB less than the desired signal level.</p> <p>c. Adjust A7C104 for maximum reply efficiency.</p> <p><u>NOTE:</u> DPSK adjustments are interactive. The adjustments in steps 2.15 thru 2.17 should be checked again before performing the remaining procedures.</p>	
2.18	<p>a. Monitor J7-33 with the oscilloscope.</p> <p>b. Interrogate the bottom channel with MODE-A and MODE-C interrogations that have a signal strength of -67 dBm.</p> <p>c. Measure and record the video amplitude of the P1 observed.</p> <p>d. Turn off all interrogations to the UUT.</p> <p>e. Enable the self-test function. Then adjust A7R122 until the P1 video signal at J7-33 is equal to the P1 video amplitude recorded above.</p>	<p>P1 video amplitude: _____</p> <p>The P1 video amplitude is within <math>\pm 0.2V</math> of the recorded in step 2.18.c above.</p>
2.19	<p>Verify that no fault codes are indicated in either the 'F3' CSDB output word or the '350' ARINC -429 maintenance data output word.</p>	
2.20	<p>If the UUT fails the Mode-S Only reply rate, as specified in step 1.1.A of Table 1001/Table 34-50-96-99A-009-A01 at ambient or during temperature test, first verify the DPSK alignment and then complete temperature testing as necessary.</p>	
2.21	<p>After alignment is complete, remove all power from the test equipment and reassemble the UUT.</p>	

Alignment Procedure  
Table 1002/Table 34-50-96-99A-010-A01

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TASK 34-50-96-820-801-A01

6. Reply Pulse Characteristics

SUBTASK 34-50-96-820-001-A01

A. ATCRBS Replies

(1) Framing Pulses

(a) The reply function shall use two framing pulses nominally spaced 20.3  $\mu$ s apart.

(2) Information Pulses

(a) The designator of the information pulses and their positions from the first framing pulse shall be:

<u>PULSE</u>	<u>POSITION (<math>\mu</math>s)</u>
C1	1.45
A1	2.90
C2	4.35
A2	5.80
C4	7.25
A4	8.70
B1	11.60
D1	13.05
B2	14.50
D2	15.95
B4	17.40
D4	18.85

SUBTASK 34-50-96-820-002-A01

B. ATCRBS SPI

(1) In addition to the information pulses provided, an SPI pulse, which may be used with any of the other information pulses upon request, shall be provided at a spacing 4.35  $\mu$ s following the last framing pulse. The SPI pulse shall be initiated by an IDENT switch. Upon activation of the IDENT switch, the SPI pulse shall be transmitted when replying to ARCRBS Mode A interrogations for a period of 18  $\pm$ 2.0 seconds.

SUBTASK 34-50-96-820-003-A01

C. ATCRBS Reply Pulse Shape

(1) All reply pulses and SPI pulses shall be 0.45  $\pm$ 0.05  $\mu$ s duration and have rise times of from 0.05 to 0.1  $\mu$ s and decay times of from 0.05 to 0.2  $\mu$ s.

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SUBTASK 34-50-96-820-004-A01

D. ATCRBS Reply Pulse Spacing Tolerances

- (1) The pulse spacing tolerances for each pulse (including the last framing pulse) with respect to the first framing pulse of the reply group shall be  $\pm 0.05 \mu\text{s}$ . The pulse spacing tolerance of the SPI pulse with respect to the last framing pulse of the reply group shall be  $\pm 0.05 \mu\text{s}$ .

SUBTASK 34-50-96-820-005-A01

E. Mode S Replies

- (1) The reply data block is formed by PPM encoding of the reply data. A pulse transmitted in the first half of the interval represents a 1, while a pulse transmitted in the second half represents a 0.

SUBTASK 34-50-96-820-006-A01

F. Mode S Preamble

- (1) The preamble shall consist of four  $0.5 \pm 0.03 \mu\text{s}$  pulses. The second, third and fourth pulses shall be spaced 1.0, 3.5, and  $4.5 \mu\text{s}$  respectively from the first transmitted pulse. The spacing tolerance shall be  $\pm 0.30 \mu\text{s}$ , measured from the first pulse of the reply.

SUBTASK 34-50-96-820-007-A01

G. Mode S Data Pulses

- (1) The block of reply data pulses shall begin  $8.0 \mu\text{s}$  after the first transmitted pulse. Either 56 or 112  $1\text{-}\mu\text{s}$  intervals shall be assigned to each transmission. A pulse with a width of  $0.5 \pm 0.03 \mu\text{s}$  shall be transmitted either in the first or in the second half of each interval. If a pulse transmitted in the second half of one interval is followed by another pulse transmitted in the first half of the next interval, the two pulses shall merge and a  $1.00 \pm 0.03 \mu\text{s}$  pulse shall be transmitted.

SUBTASK 34-50-96-820-008-A01

H. Mode S Reply Pulse Shape

- (1) The pulse amplitude variation between one pulse and any other pulse in a reply shall not exceed 2 dB.
- (2) The pulse rise time shall not exceed  $0.1 \mu\text{s}$ .
- (3) The pulse decay time shall not exceed  $0.2 \mu\text{s}$ .

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TASK 34-50-96-810-803-A01

7. Non-Procurement Parts Replacements

- A. Table 1003/Table 34-50-96-99A-011-A01 below lists replacement CPNs for circuit card/assemblies, as well as components used on circuit cards that are no longer procurable. Use all existing stock of the non-procurable part before using its replacement.

ASSY	ASSEMBLY CPN/ DESCRIPTION	REFERENCE DESIGNATORS	NON- PROCURABLE CPN	REPLACEMENT CPN	REPLACEMENT CONDITIONS
CIRCUIT CARD ASSEMBLY REPLACEMENT					
A4	687-0724-002 Synthesizer Circuit Card	A4	687-0724-002	687-0724-003	Must install SB 24
A6	687-0726-005 Video Processor Circuit Card	A6	687-0726-005	687-0726-006	Direct
A6	687-0726-006 Video Processor Circuit Card	A6	687-0726-006	687-0726-007	Direct
CIRCUIT CARD COMPONENT REPLACEMENT					
A2	687-0724-004 Power Amplifier Circuit Card	Q102	843-1507-010	843-1507-020	Direct
A2	687-0724-004 Power Amplifier Circuit Card	Q105	843-0023-020	843-0023-030	Direct
A3	687-0723-004 Modulator Circuit Card	Q106	352-7904-070	352-7904-080	Direct
A3	687-0723-004 Modulator Circuit Card	Q211	843-0013-030	843-0013-070	Direct
A3	687-0723-005 Modulator Circuit Card	Q106	352-7904-080	352-7904-070	Direct
A5	828-2700-002 CPU-I/O Circuit Card	U12	835-5502-010	351-4950-010	Direct
A6	687-0726-004/005 Video Processor Circuit Card	U215	835-1526-010	351-3460-010	Direct

TDR-94/94D Non-Procurement Parts Replacements  
Table 1003/Table 34-50-96-99A-011-A01





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**SCHEMATIC AND WIRING DIAGRAMS**

TASK 34-50-96-810-804-A01

1. Introduction

- A. This section shows the maintenance aid and schematic diagrams for the TDR94/94D ATC/Mode S Transponder.

TASK 34-50-96-810-805-A01

2. Modification History

- A. Table 2001 shows the causes for changes to the TDR-94/94D. This data helps the technician to know the cause for a service bulletin and gives the changes done to the equipment.

SERVICE BULLETIN	REASON/DESCRIPTION
1-12	Factory-installed on all units.
13	Converts the -003 status Class 2A Mode S transponder to a -004 status Class 3A/ADSB Mode S Transponder. This modification provides : <ul style="list-style-type: none"> <li>• Enhanced TCAS operation (termed "Change 7")</li> <li>• Enhanced Mode S data link communications (termed "Class 3A" or Comm-C"</li> <li>• Provisioning for first step in free-flight via use of the Extended Mode S squitter (termed "ADS-B").</li> <li>• Provisions for the reception of Special Category I (SCAT-I) Differential Global Navigation Satellite System data via a Mode-S uplink.</li> <li>• Three new ARINC 429 input data busses; GPS Data In (J2-49/50), FMS/IRS Data In (J2-27/28), and AIS/ADS Data In (J2-39/40)</li> <li>• Twelve new discrete input pins.</li> </ul>
14	A combination of high interrogation rates and self-test procedures may cause uncommanded transitions to the STANDBY mode when the TDR-94/94D is interfaced with Gables Control Units operating in the BURST mode. When in the STANDBY mode and the AIR/GROUND #2 discrete (J1-27) changes from "on-ground" to "in-air," the unit may reply to interrogations while continuing to indicate that the unit is in STANDBY mode. This modification reprograms CPU I/O Circuit Card A5 to correct this problem.
15	In some installations the TDR-94/94D may cause interference with VHF Comm reception when the transmitter is tuned to 120 MHz. Installation of this service bulletin reduces electromagnetic emissions from the TDR-94/94D Transponders. The modification adds 31 jumper wires to Video Processor circuit card A6, 687-0726-004/005.

Modification History Cont.  
Table 2001/Table 34-50-96-99A-012-A01

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SERVICE BULLETIN	REASON/DESCRIPTION
16	<p>In aircraft which parallel the CSDB/ARINC429 Control Select and Burst Enable inputs to other systems, removal of transponder power may cause unrequested activation of the function in another system. The dual diode isolation provided by Service Bulletin No. 12 reduces noise margin for the selection circuits. In cases where the aircraft provision for mode selection also includes an isolation diode, this margin becomes inadequate for reliable operation. This service bulletin changes to a single isolation diode to restore the noise margin to an acceptable level.</p> <p>TDR-94 Transponder (CPN 622-9352-004/005) and TDR-94D Transponder (CPN 622-9210-004/005) already contain this modification by design. Installation of this service bulletin in the -004/005 statuses only updates the marking indicating SB 16 is installed.</p>
17	<p>Installation of this service bulletin corrects a subtle error in the status indications of some altitude replies. The actual altitude reported is correct at all times. Gillham (gray code) altitude sources have 100 foot resolution. However, the transponder will set the altitude resolution status to indicate 25 foot resolution when connected to a Gillham altitude source. The altitude resolution status is set correctly for aircraft that have digital source of altitude information. It is highly recommended that aircraft with Gillham-based altitude encoders install this service bulletin.</p>
18	<p>In TDR-94 Transponders, installation of this service bulletin converts the non-diversity TDR-94 Transponder to the diversity capable TDR-94D Transponder. Diversity capability allows the transponder to utilize two antennas, one each on the top and bottom of the aircraft. TCAS requires diversity transponders.</p> <p>In TDR-94D Transponders, installation of this service bulletin adds the service bulletin marking which may be required since current production units are marked with Service Bulletin 18.</p>
19	<p>The -004 and -005 versions of the TDR-94D may cause the Change 7 version of non-Rockwell Collins TCAS systems to produce a TCAS flag, or intermittent TCAS flag, when the TCAS is in the Standby mode. This service bulletin installs new software in the TDR-94D that improves the robustness of the TCAS Change 7 data bus and improves compatibility with non-Rockwell Collins TCAS units.</p> <p>The formatting of Flight ID data is updated to comply with the ARINC 718-4 definition.</p> <p>The correct processing of the Gillham altitude 100-foot resolution bit originally addressed by Service Bulletin 17 is also incorporated.</p>

Modification History Cont.  
Table 2001/Table 34-50-96-99A-012-A01

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SERVICE BULLETIN	REASON/DESCRIPTION
20	<p>The -004 and -005 versions of the TDR-94D may cause the Change 7 version of non-Rockwell Collins TCAS systems to produce a TCAS flag, or intermittent TCAS flag, when the TCAS is in the Standby mode. This service bulletin installs new software in the TDR-94D that improves the robustness of the TCAS Change 7 data bus and improves compatibility with non-Rockwell Collins TCAS units.</p> <p>The formatting of Flight ID data is updated to comply with the ARINC 718-4 definition.</p> <p>The correct processing of the Gillham altitude 100-foot resolution bit originally addressed by Service Bulletin 17 is also incorporated.</p>
21	<p>The -006 version of the TDR-94/94D may cause the Change 7 version of non-Rockwell Collins TCAS systems to produce a brief intermittent TCAS flag. The fault is normally recovered automatically and may not be seen by the operator.</p> <p>The transponder may intermittently report a "C1" or "C2" Squitter fault that will cause some non-Rockwell Collins control heads to change to a standby state.</p> <p>This service bulletin installs new software in the TDR-94/94D that improves the robustness of the TCAS Change 7 data bus to improve compatibility with non-Rockwell Collins TCAS units and incorporates improvements to the Squitter self-test circuitry.</p>
22	<p>In some installations the TDR-94/94D may cause interference of VHF reception when transmitter is tuned to 120 MHz. Comm squelch breaks at 120 MHz have been identified in installations with minimum transponder/comm isolation. Installation of this service bulletin will greatly reduce potential interference with VHF Communications.</p>
23	<p>All fielded -007 status TDR-94 and TDR-94D units do not display JTSO approval. This service bulletin replaces the nameplate with one that allows usage in European airspace.</p>
24	<p>This service bulletin replaces obsolete synthesizer circuit cards 687-0724-001/002 with 687-0724-003 when there is a need that warrants replacement of the card.</p>
25	<p>This service bulletin replaces IF receiver circuit card A7 and the IF receiver cover if U107 fails on the circuit card.</p>
26	<p>U413 on synthesizer circuit card A4 is replaced to improve a temperature-related power-up problem on unit delivered during February through May of 2005. These units may not power up correctly after exposure to temperatures of -55°C or below. This condition may also occur if unit power is cycled in mid-flight at extreme altitudes.</p>

Modification History Cont.  
Table 2001/Table 34-50-96-99A-012-A01

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SERVICE BULLETIN	REASON/DESCRIPTION
501	<p>This modification converts -004, -005, and -006 status TDR-94/94D units to -007 status units by reprogramming Processor circuit card A5 and replacing one EPROM. The -007 status TDR-94/94D is compliant with European requirements for Elementary and Enhanced Surveillance for SSR Mode S operation. This capability allows the transponder to process aircraft Flight Identification inputs and to support expanded ground station Surveillance Identifier (SI codes). In addition, the new capability also provides:</p> <ul style="list-style-type: none"> <li>• Changes TDR data output bus label 200 so that altitude data is always Gillham formatted.</li> <li>• Labels 275 and 276, containing the 24-bit ICAO address, are added to the TDR data output bus.</li> <li>• TCAS Sensitivity Level Command (SLC) is restricted to Uplink Formats (UF) with Designator Identification (DI) fields with either a 1 or a 7.</li> <li>• When utilizing Gillham comparison of altitude from ARINC 429 control inputs and Gillham inputs, the altitude is no longer used when the ARINC control input is lost.</li> </ul>
502	<p>This modification converts the -007 status TDR-94/94D units to -008 status units by replacing CPU I/O Processor circuit card A5. Video Processor circuit card A6 is also modified by removing one capacitor and adding a jumper wire. Current -007 units do not provide source selection required for PL4/21 installations. Conversion of -007 status units to -008 status unit will provide the enhanced surveillance required in PL4/21 installations.</p>
503	<p>This modification converts -007 and -008 status TDR-94/94D units to -108 status units, which will provide ADS-B capability. On -007 status units, CPU I/O Processor circuit card A5 is replaced. On -008 status units, various hardware changes are made.</p>

Modification History  
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TASK 34-50-96-810-806-A01

3. Schematic Changes Page, Maintenance Aid, and Schematic Diagrams

SUBTASK 34-50-96-810-006-A01

A. Schematic Changes Page

- (1) Shown before each maintenance aid diagram is a schematic changes page. The schematic changes page gives a list of the changes made to the schematic diagram. This page also shows the applicable service bulletin numbers, the change effectivity, and the sheet of the schematic that changed. An arrow identifies a change made on the schematic diagram. This arrow contains the change identification number (Revision Ident) and points to the area of the schematic that changed.
- (2) The factory puts a revision identification letter (REV) on a changed assembly. When the change is related to a service bulletin, you must put a modification (MOD) label that contains the service bulletin number on the assembly. Changes made to a completed assembly are shown on the unit with a MOD number and a change (REV) letter.

SUBTASK 34-50-96-810-007-A01

B. Maintenance Aid Diagrams

- (1) The maintenance aid diagram shows the location of all components on the primary assemblies. This diagram is before the schematic diagram in the manual. The maintenance aid diagram also shows a history of the component configuration. The maintenance aid diagram can look different than the circuit card/assembly.

SUBTASK 34-50-96-810-008-A01

C. Schematic Diagrams

- (1) The schematic diagram helps the technician isolate a fault in a circuit to a defective component. Where applicable, circuit voltages and test points are shown. The schematic diagram shows the most correct electrical configuration at the time of print for the manual. Refer to the schematic changes page shown before the maintenance aid diagram for all changes made.

SUBTASK 34-50-96-810-009-A01

D. Configuration Effectivity

- (1) Table 2002 shows the revision level (at the time of print) of circuit cards or subassemblies of the TDR-94/94D that have a schematic diagram. Figure numbers for the maintenance aid and schematic diagrams are also shown.
- (2) Rockwell Collins uses the procedure that follows to identify the configuration (or revision level) of a unit or subassembly.
  - (a) A 2-letter (maximum) identifier is shown after the letters REV (revision). If no changes have been done, the identifier starts with - (dash). The first change is

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identified as A, the second as B, and continues through Y, then to AA, AB, and continues to YY. (Letters I, O, Q, S, X, and Z are not used).

- (b) Rework includes changes in a unit or a subassembly sent back to Rockwell Collins for repair, or removed from the company's available units. At the time of rework, the unit or subassembly is identified with the revision level mark (letter) of the changes made. When done, the original mark is left on the unit or subassembly and the letters RWK (rework) are added. This is followed with the letter identifier of the newest revision done during rework. For example, unit one has the mark of REV B - RWK F, and unit two has the mark of REV F. This shows that the two units are at revision F, but unit one is reworked and can look different from the other.

**NOTE:** A reworked unit may not contain all the changes made to a new unit with the same identifier. This unit does contain changes necessary to make the unit operate the same as a new unit with the same identifier. A unit reworked to a specified revision identifier can look different from a new unit with the same revision identifier.

- (c) This section includes only letter revision identifiers that cause schematic changes. A unit or subassembly can have a letter identifier that comes between the identifiers on the schematic changes page. Table 2002 can show a list that includes the newest revision or other revisions. When this occurs, the schematic shows the revision identifiers given on the Schematic Changes Page and can also show the newest revision identifier.

SUBASSEMBLY/ UNITS	REVISION LEVEL	COLLINS PART NUMBER	MAINTENANCE AID DIAGRAM	SCHEMATIC DIAGRAM
High-Voltage Power Supply Circuit Card A1	L	687-0721-002	Figure 2001/ GRAPHIC 34-50- 96-99B-036-A01	Figure 2002/ GRAPHIC 34-50- 96-99B-037-A01
High-Voltage Power Supply Circuit Card A1	C	687-0721-003	Figure 2003/ GRAPHIC 34-50- 96-99B-038-A01	Figure 2004/ GRAPHIC 34-50- 96-99B-039-A01
Power Amplifier Circuit Card A2	AA	687-0722-003	Figure 2005/ GRAPHIC 34-50- 96-99B-040-A01	Figure 2006/ GRAPHIC 34-50- 96-99B-041-A01
Power Amplifier Circuit Card A2	K	687-0722-004	Figure 2007/ GRAPHIC 34-50- 96-99B-042-A01	Figure 2008/ GRAPHIC 34-50- 96-99B-043-A01

Assembly Revision Level and Diagram Reference Cont.  
Table 2002/Table 34-50-96-99A-013-A01

**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
TDR-94, PART NO 622-9352

SUBASSEMBLY/ UNITS	REVISION LEVEL	COLLINS PART NUMBER	MAINTENANCE AID DIAGRAM	SCHEMATIC DIAGRAM
Power Amplifier Circuit Card A2	A	687-0722-006	Figure 2008.1/ GRAPHIC 34-50- 96-99B-096-A01	Figure 2008.2/ GRAPHIC 34-50- 96-99B-097-A01
Modulator Circuit Card A3	K	687-0723-004	Figure 2009/ GRAPHIC 34-50- 96-99B-044-A01	Figure 2010/ GRAPHIC 34-50- 96-99B-045-A01
Modulator Circuit Card A3	B	687-0723-005	Figure 2011/ GRAPHIC 34-50- 96-99B-046-A01	Figure 2012/ GRAPHIC 34-50- 96-99B-047-A01
Synthesizer Circuit Card A4	K	687-0724-002	Figure 2013/ GRAPHIC 34-50- 96-99B-048-A01	Figure 2014/ GRAPHIC 34-50- 96-99B-049-A01
Synthesizer Circuit Card A4	D	687-0724-003	Figure 2015/ GRAPHIC 34-50- 96-99B-050-A01	Figure 2016/ GRAPHIC 34-50- 96-99B-051-A01
CPU-I/O Programmed Assembly A5	C	653-3674-001	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	B	653-3674-002	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	E	653-3674-003	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	D	653-3674-004	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	G	653-3674-005	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	F	653-3674-006	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	A	653-3674-007	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01

Assembly Revision Level and Diagram Reference Cont.  
Table 2002/Table 34-50-96-99A-013-A01

**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
TDR-94, PART NO 622-9352

SUBASSEMBLY/ UNITS	REVISION LEVEL	COLLINS PART NUMBER	MAINTENANCE AID DIAGRAM	SCHEMATIC DIAGRAM
CPU-I/O Programmed Assembly A5	A	653-3674-008	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	A	653-3674-009	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	A	653-3674-010	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	A	653-3674-011	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	A	653-3674-012	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	A	653-3674-013	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	A	653-3674-014	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	C	653-3674-015	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	C	653-3674-016	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	B	653-3674-017	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Programmed Assembly A5	B	653-3674-018	Figure 2017/ GRAPHIC 34-50- 96-99B-052-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01
CPU-I/O Circuit Card A5A1 (unprogrammed)	M	828-2700-002	Figure 2018/ GRAPHIC 34-50- 96-99B-053-A01	Figure 2019/ GRAPHIC 34-50- 96-99B-054-A01

Assembly Revision Level and Diagram Reference Cont.  
Table 2002/Table 34-50-96-99A-013-A01



**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
TDR-94, PART NO 622-9352

SUBASSEMBLY/ UNITS	REVISION LEVEL	COLLINS PART NUMBER	MAINTENANCE AID DIAGRAM	SCHEMATIC DIAGRAM
CPU-I/O Circuit Card A5A1 (unprogrammed)	C	828-2700-003	Figure 2020/ GRAPHIC 34-50- 96-99B-055-A01	Figure 2021/ GRAPHIC 34-50- 96-99B-056-A01
CPU-I/O Programmed Assembly A5	-	653-3674-025	Figure 2021.1/ GRAPHIC 34-50- 96-99B-098-A01	Figure 2021.2/ GRAPHIC 34-50- 96-99B-099-A01
CPU-I/O Programmed Assembly A5	-	653-3674-026	Figure 2021.1/ GRAPHIC 34-50- 96-99B-098-A01	Figure 2021.2/ GRAPHIC 34-50- 96-99B-099-A01
CPU-I/O Circuit Card A5A1 (unprogrammed)	A	828-2700-004	Figure 2021.1/ GRAPHIC 34-50- 96-99B-098-A01	Figure 2021.2/ GRAPHIC 34-50- 96-99B-099-A01
Video Processor Circuit Card A6	R	687-0726-004	Figure 2023/ GRAPHIC 34-50- 96-99B-058-A01	Figure 2024/ GRAPHIC 34-50- 96-99B-059-A01
Video Processor Circuit Card A6	J	687-0726-005	Figure 2025/ GRAPHIC 34-50- 96-99B-060-A01	Figure 2026/ GRAPHIC 34-50- 96-99B-061-A01
Video Processor Circuit Card A6	D	687-0726-006	Figure 2027/ GRAPHIC 34-50- 96-99B-062-A01	Figure 2028/ GRAPHIC 34-50- 96-99B-063-A01
Video Processor Circuit Card A6	-	983-8019-001	Figure 2027/ GRAPHIC 34-50- 96-99B-062-A01	Figure 2028/ GRAPHIC 34-50- 96-99B-063-A01
Video Processor Circuit Card A6	B	687-0726-007	Figure 2028.1/ GRAPHIC 34-50- 96-99B-100-A01	Figure 2028.2/ GRAPHIC 34-50- 96-99B-101-A01
IF Receiver, DPSK Detector, and LVPS Circuit Card A7	D	687-0727-004	Figure 2029/ GRAPHIC 34-50- 96-99B-064-A01	Figure 2030/ GRAPHIC 34-50- 96-99B-065-A01
IF Receiver, DPSK Detector, and LVPS Circuit Card A7	J	687-0727-005	Figure 2031/ GRAPHIC 34-50- 96-99B-066-A01	Figure 2032/ GRAPHIC 34-50- 96-99B-067-A01

Assembly Revision Level and Diagram Reference  
Table 2002/Table 34-50-96-99A-013-A01



**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
TDR-94, PART NO 622-9352

**MAINTENANCE AID/SCHEMATIC CHANGES**

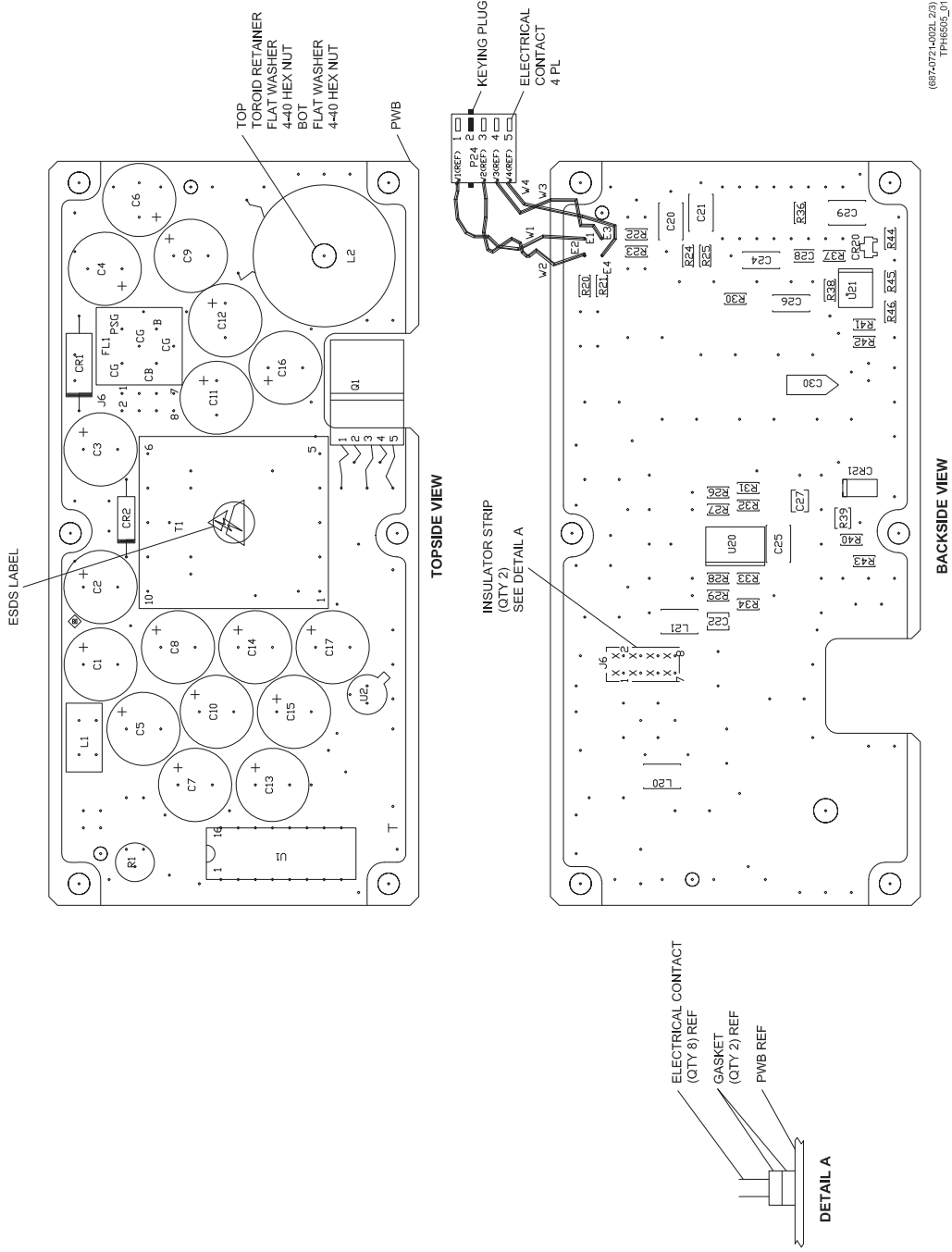
REVISION IDENT (SHEET)	DESCRIPTION OF REVISION AND CAUSE FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY MARKING
N/A	Printed wire board change only.		REV A
N/A	U20 changed from 351-1278-030 (type 2903) to 351-0656-010 (type 2901). Earlier part became obsolete.		REV B
N/A	Data change only.		REV C
D	C29 changed from 184-2551-210 (10 $\mu$ F) to 913-3670-740 (0.1 $\mu$ F). Improve start-up time.	11	REV D
E	For yield improvement: R32 changed from 705-3535-690, 432 $\Omega$ to 705-3535-750, 499 $\Omega$ R31 changed from 705-3537-330, 2.21k $\Omega$ to 705-3537-320, 2.15k $\Omega$ R33 changed from 705-3535-950, 825 $\Omega$ to 705-3535-170, 845 $\Omega$ R34 changed from 705-3537-370, 2.43k $\Omega$ to 705-3537-380, 2.49k $\Omega$		REV E
N/A	Replaced C1 thru C17 to eliminate use of gasket. New capacitors have potted end to provide flat mounting surface.		REV F
N/A	Deleted top washer from L2 mounting hardware.		REV G
N/A	Production process changes only.		REV H and J
N/A	Changed CPN of L2 mounting hardware. No change to schematic.		REV K
N/A	Internal documentation change only.		REV L

High Voltage Power Supply Circuit Card A1 (CPN 687-0721-002), Maintenance Aid and Schematic Changes

Table 2003/Table 34-50-96-99A-014-A01



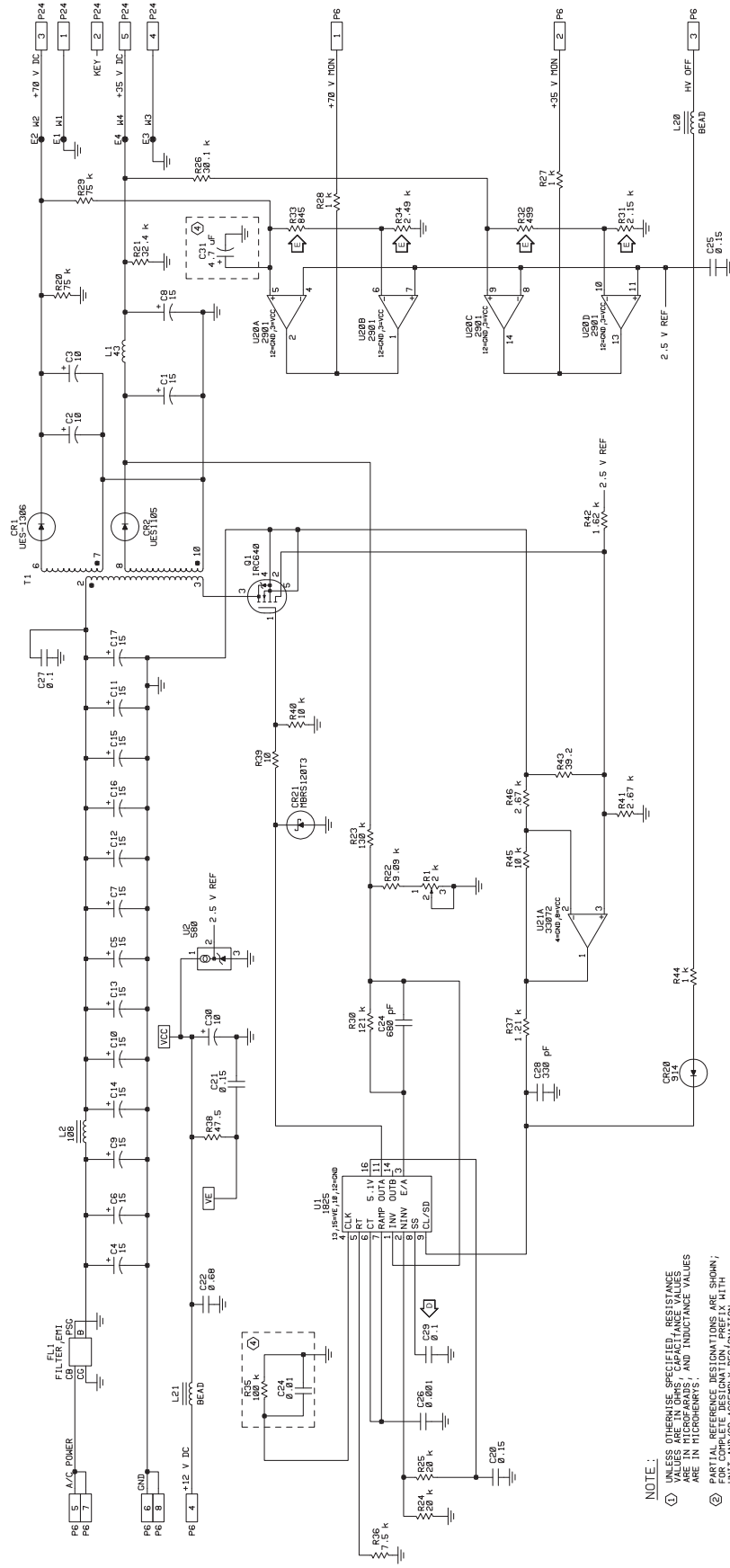
**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
 TDR-94, PART NO 622-9352



High Voltage Power Supply Circuit Card A1 (CPN 687-0721-002) Maintenance Aid Diagram  
 Figure 2001/GRAPHIC 34-50-96-99B-036-A01



ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



(82P-755-1402D)  
 CG6-554201-AC

- NOTE:
- ① VALUES OTHER THAN SPECIFIED RESISTANCE VALUES ARE IN OHMS; CAPACITANCE VALUES ARE IN MICROFARADS; AND INDUCTANCE VALUES ARE IN MICROHENRYS.
  - ② FOR COMPLETE DESIGNATION, PREFIX, UNIT, AND/OR ASSEMBLY DESIGNATION.
  - ③ A DASH AND THE LETTER F IS USED TO REPRESENT THE DIGITAL EQUIVALENT OF AN OHMSHORE FOR SIGNAL TEXT ON THIS DRAWING.
  - ④ C24, C31 AND R35 ARE FOR FUTURE USE.

High Voltage Power Supply Circuit Card A1 (CPN 687-0721-002), Schematic Diagram  
 Figure 2002/GRAPHIC 34-50-96-99B-037-A01





**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
TDR-94, PART NO 622-9352

**MAINTENANCE AID/SCHEMATIC CHANGES**

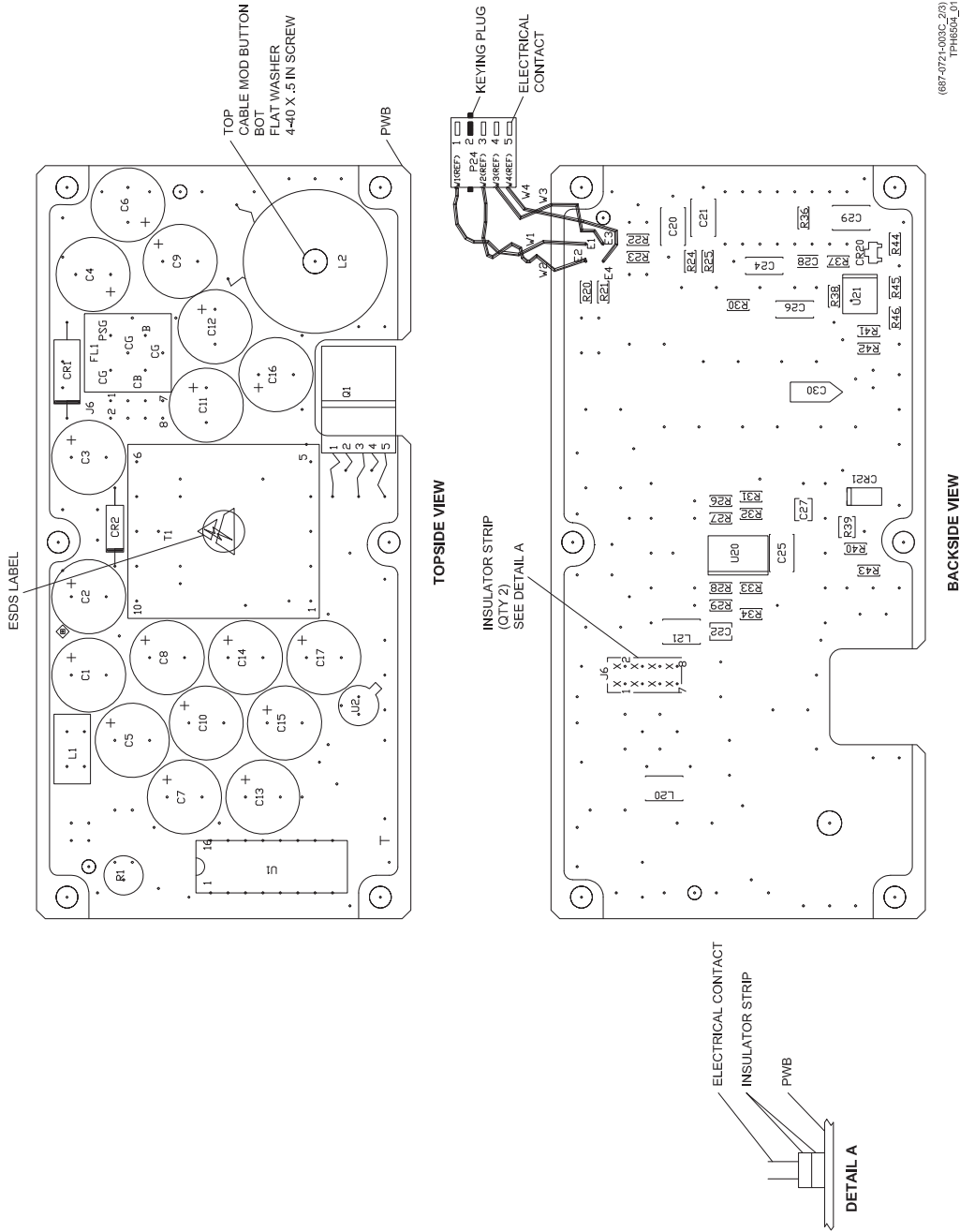
REVISION IDENT (SHEET)	DESCRIPTION OF REVISION AND CAUSE FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY MARKING
N/A	Implemented circuit card in TDR-94/94D main chassis assemblies.		REV -
N/A	Added silicone to circuit card to prevent capacitors from moving.		REV A
N/A	Internal documentation change only.		REV B
N/A	Changed CPN for L2 mounting screw. Previous CPN was incorrect.		REV C

High Voltage Power Supply Circuit Card A1 (CPN 687-0721-003), Maintenance Aid and Schematic Changes

Table 2004/Table 34-50-96-99A-015-A01



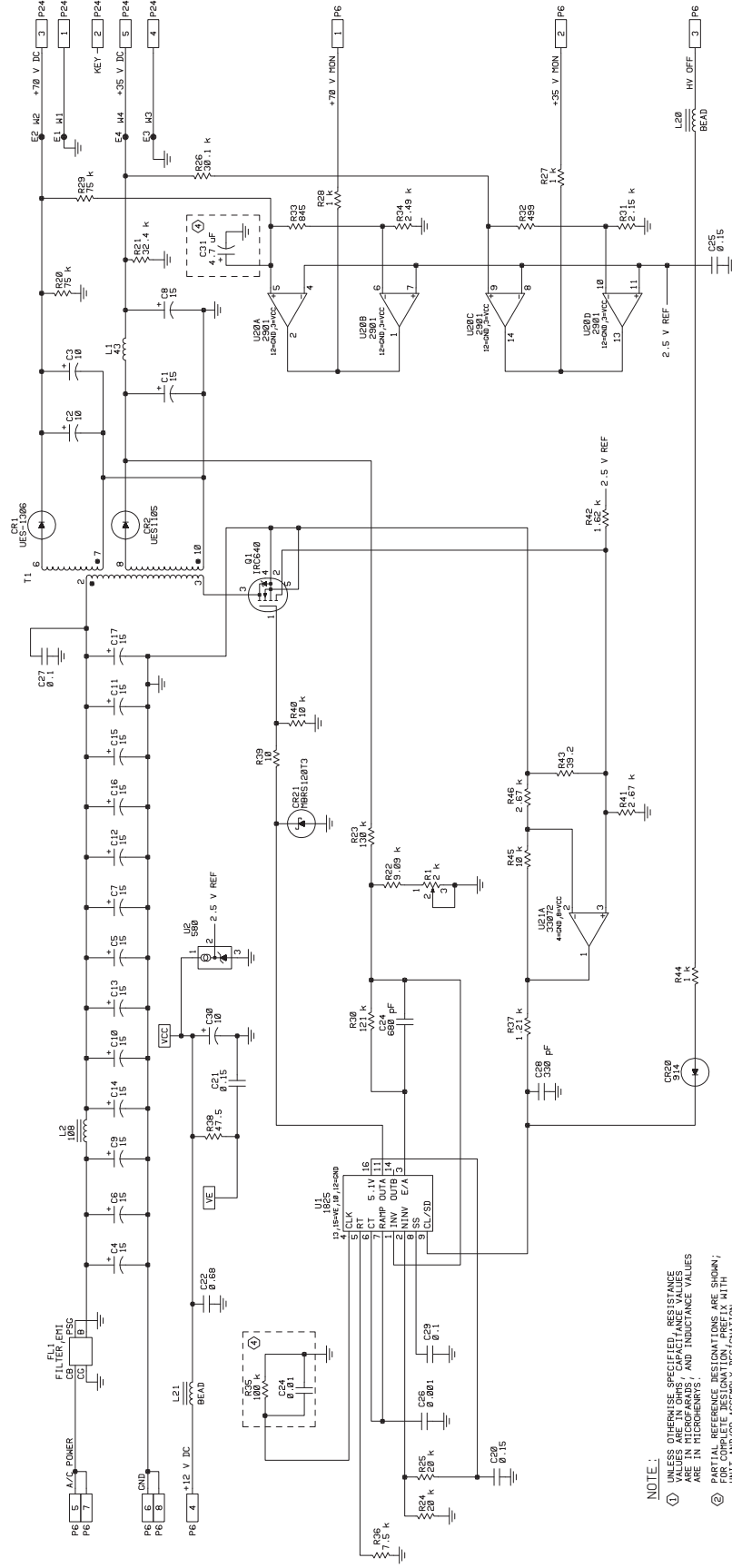
ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



High Voltage Power Supply Circuit Card A1 (CPN 687-0721-003) Maintenance Aid Diagram  
 Figure 2003/GRAPHIC 34-50-96-99B-038-A01



ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



(829-7561-003-1)  
 TPH6562\_01

- NOTE:
- UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS; CAPACITANCE VALUES ARE IN MICROFARADS, AND INDUCTANCE VALUES ARE IN MICROHENRYS.
  - PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.
  - A DASH AND THE LETTER F IS USED TO DENOTE A PART NUMBER DIFFERENT FROM THE STANDARD NUMBER. REFER TO THE COMPONENT SPECIFICATION FOR SIGNAL TEXT ON THIS BRANCH.
  - C24, C31, AND R35 ARE FOR FUTURE USE.

High Voltage Power Supply Circuit Card A1 (CPN 687-0721-003), Schematic Diagram  
 Figure 2004/GRAPHIC 34-50-96-99B-039-A01



**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
TDR-94, PART NO 622-9352

**MAINTENANCE AID/SCHEMATIC CHANGES**

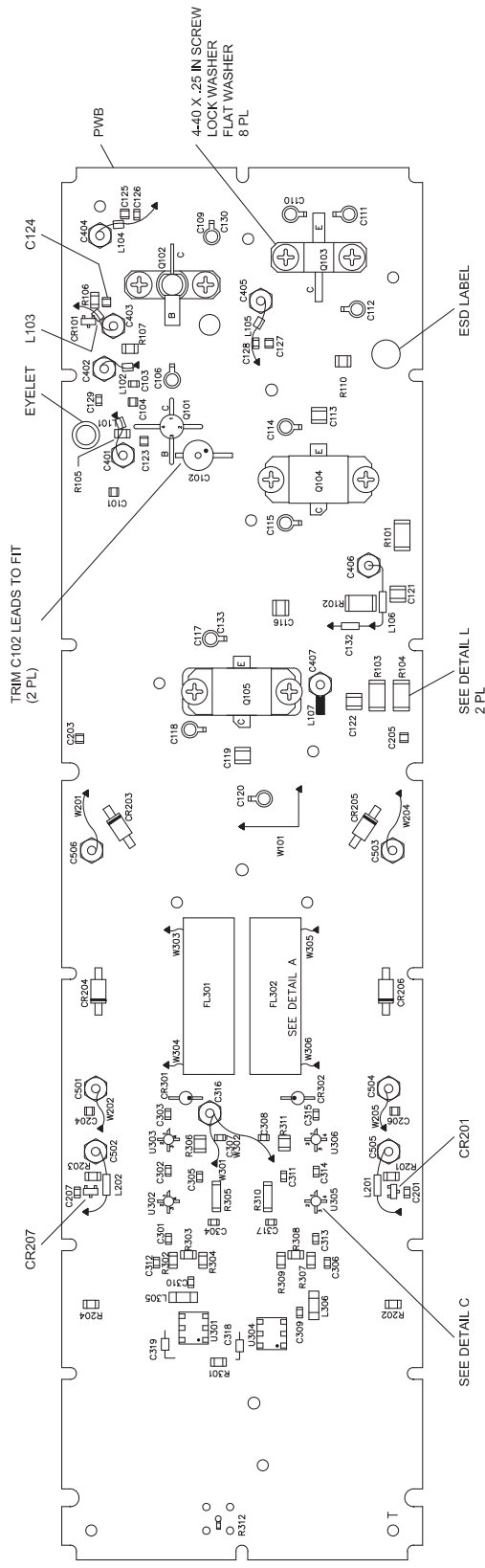
REVISION IDENT (SHEET)	DESCRIPTION OF REVISION AND CAUSE FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY MARKING
N/A	First production.		REV B
N/A	Relocated R302.		REV C
D (2)	Added L201 and L202; deleted W203 and W206 to correct false power monitor indicator.		REV D
N/A	Production assembly change only.		REV E
F (2)	Changed value of R302 and R303 to test selects so units with lower than normal receiver gain can be adjusted.		REV F
N/A	Data change only.		REV G
N/A	Changed conductive adhesive from 005-1021-010 to 005-0721-000.		REV H
J (1)	Added R108 and R109 (20 ohms) and changed C132 from 0.056 to 0.01 $\mu$ F to improve spectrum.		REV J
N/A	Changed CR201 and CR207 part numbers; earlier parts are not procurable.		REV K
N/A	Added sleeving to U101 lead to prevent shorting to chassis.		REV L
N/A	Changed Q102, L305, and L306 part numbers; earlier parts are not procurable.		REV M
N (2)	Added C318, C319, and R312 to help the receiver pass the side-lobe suppression test.		REV N
N/A	Changed U301 and U304 part numbers; earlier parts are not procurable.		REV P
N/A	Data change only.		REV R
T (1)	Changed Q102 from type SD1802 to 23A008.		REV T
U (2)	Replaced diodes CR203 thru CR206 with a more robust part.		REV U
N/A	Production process change only.		REV V
N/A	Internal documentation change only.		REV W and Y
AA (1)	Changed Q102 from 23A008 to SD1802. Changed Q105 from MRF10500 to MRF10502.		REV AA

Power Amplifier Circuit Card A2 (CPN 687-0722-003), Maintenance Aid and Schematic Changes  
Table 2005/Table 34-50-96-99A-016-A01

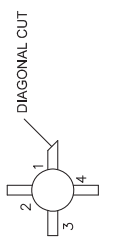
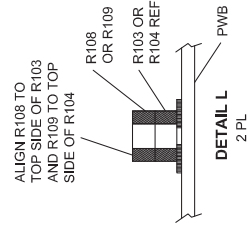




**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
 TDR-94, PART NO 622-9352



**TOPSIDE VIEW**



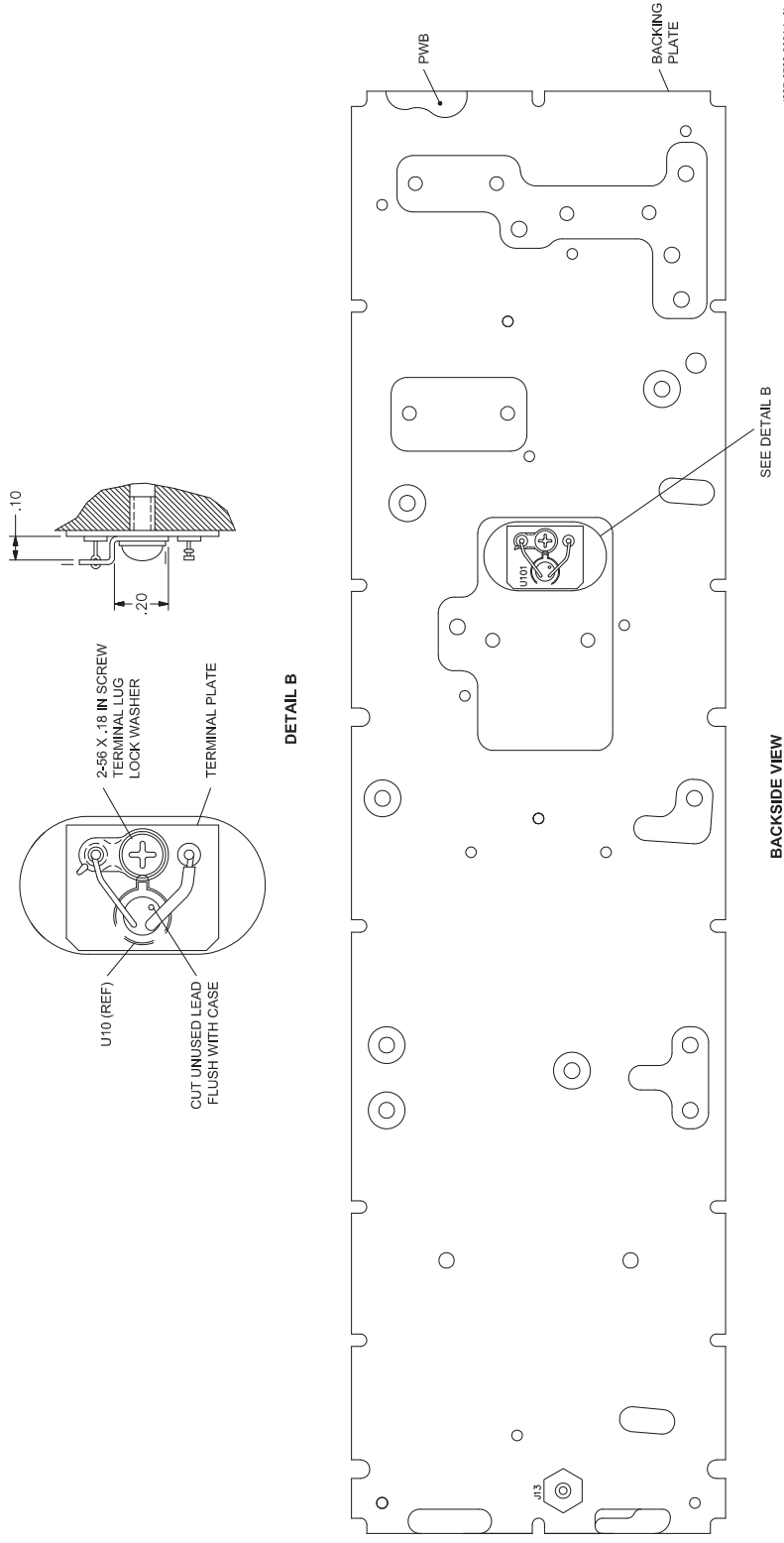
**DETAIL C**  
 U302, 303, 305, 306

(687-0722-03AA, 3)  
 CGS-4866-03-AC-1

Power Amplifier Circuit Card A2 (CPN 687-0722-003), Maintenance Aid Diagram  
 Figure 2005 (Sheet 1 of 3)/GRAPHIC 34-50-96-99B-040-A01



ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



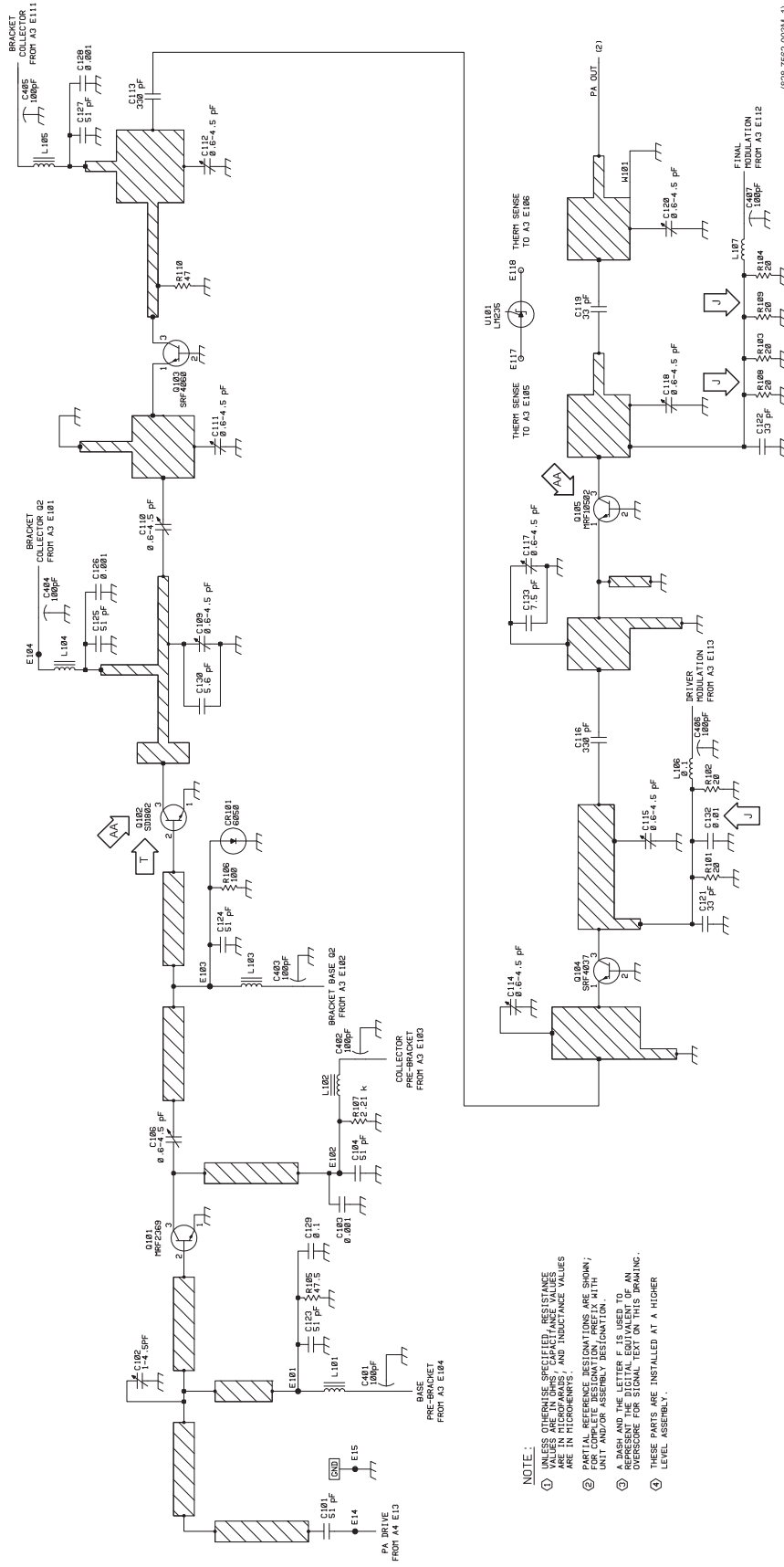
Power Amplifier Circuit Card A2 (CPN 687-0722-003), Maintenance Aid Diagram  
 Figure 2005 (Sheet 2 of 3)/GRAPHIC 34-50-96-99B-040-A01







ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



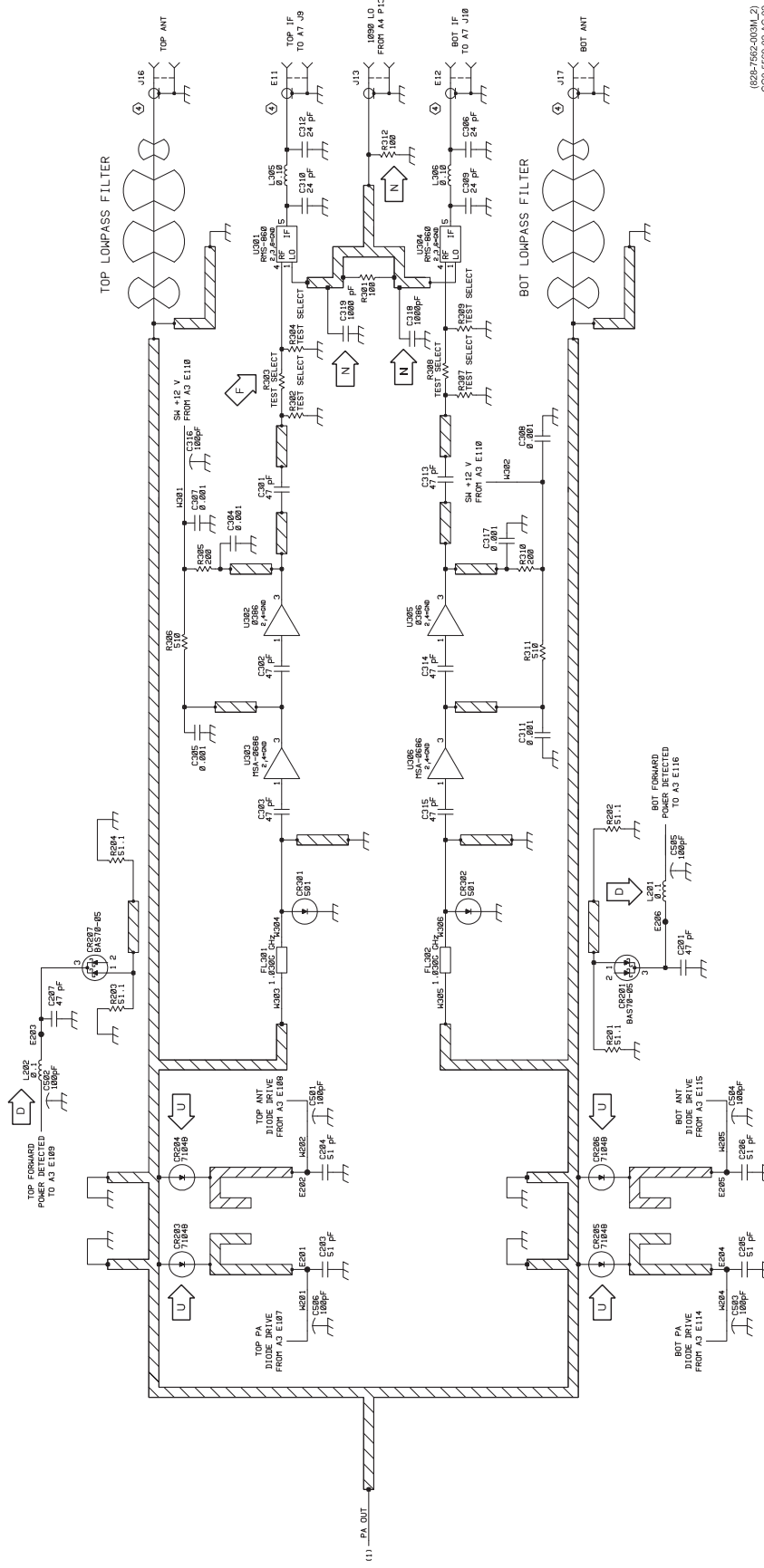
(622-7562-003M\_1)  
 CGI-5589-02-AC01

Power Amplifier Circuit Card A2 (CPN 687-0722-003), Schematic Diagram  
 Figure 2006 (Sheet 1 of 2)/GRAPHIC 34-50-96-99B-041-A01





ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



(828-7562-003ML2)  
 CGP-58980-AC02

Power Amplifier Circuit Card A2 (CPN 687-0722-003), Schematic Diagram  
 Figure 2006 (Sheet 2 of 2)/GRAPHIC 34-50-96-99B-041-A01



**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
TDR-94, PART NO 622-9352

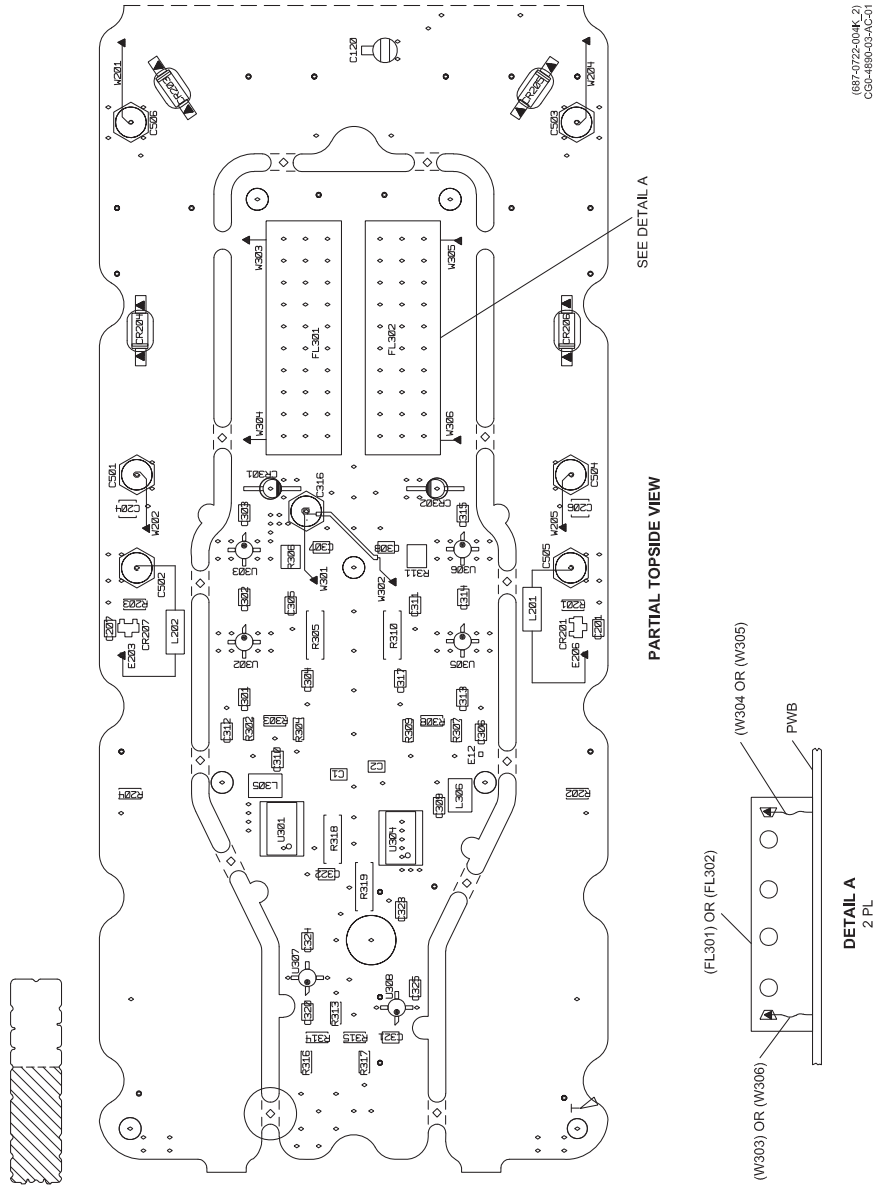
**MAINTENANCE AID/SCHEMATIC CHANGES**

REVISION IDENT (SHEET)	DESCRIPTION OF REVISION AND CAUSE FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY MARKING
N/A	First production.		REV A
N/A	Replaced diodes CR203 thru CR206 with a more robust part.		REV B
N/A	Data error correction.		REV C
N/A	Removed item 3 heatsink compound; it is no longer required.		REV D
E (1)	Changed Q102 from SD1802 to 23A008 to improve production yield. The SD1802 transistor is retained as a alternate part that can be used if necessary.		REV E
F (2)	Pin numbers of U301 and U304 were previously shown incorrectly on schematic. These have been fixed.		REV F
N/A	Internal documentation change only.		REV G
H (1)	Changed Q102 from 23A008 back to SD1802 and retained the 23A008 transistor as the alternate part. Also changed Q105 from MRF10500 to MRF10502.		REV H
N/A	Added detail G to maintenance aid diagram to show the correct installation of C132.		REV J
N/A	Internal documentation change only.		REV K

Power Amplifier Circuit Card A2 (CPN 687-0722-004), Maintenance Aid and Schematic Changes  
Table 2006/Table 34-50-96-99A-017-A01



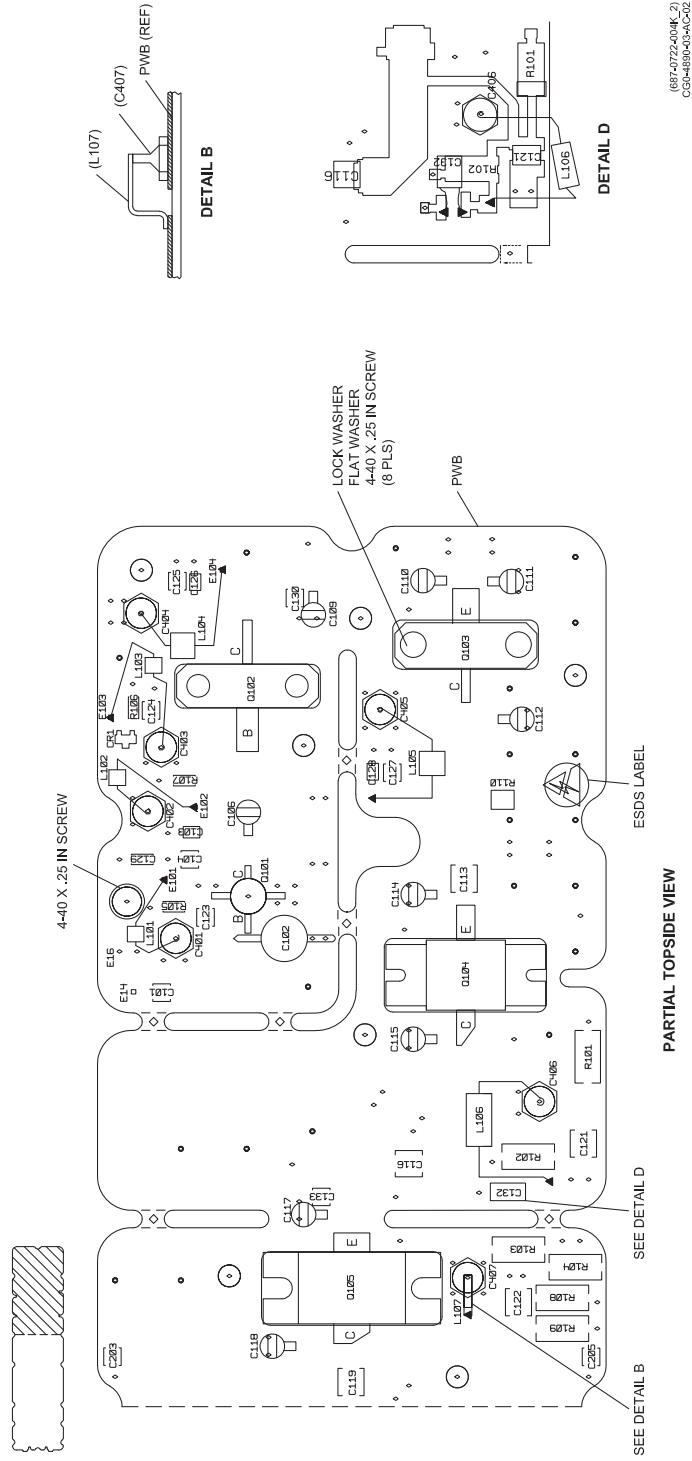
ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



Power Amplifier Circuit Card A2 (CPN 687-0722-004), Maintenance Aid Diagram  
 Figure 2007 (Sheet 1 of 3) GRAPHIC 34-50-96-99B-042-A01



ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352

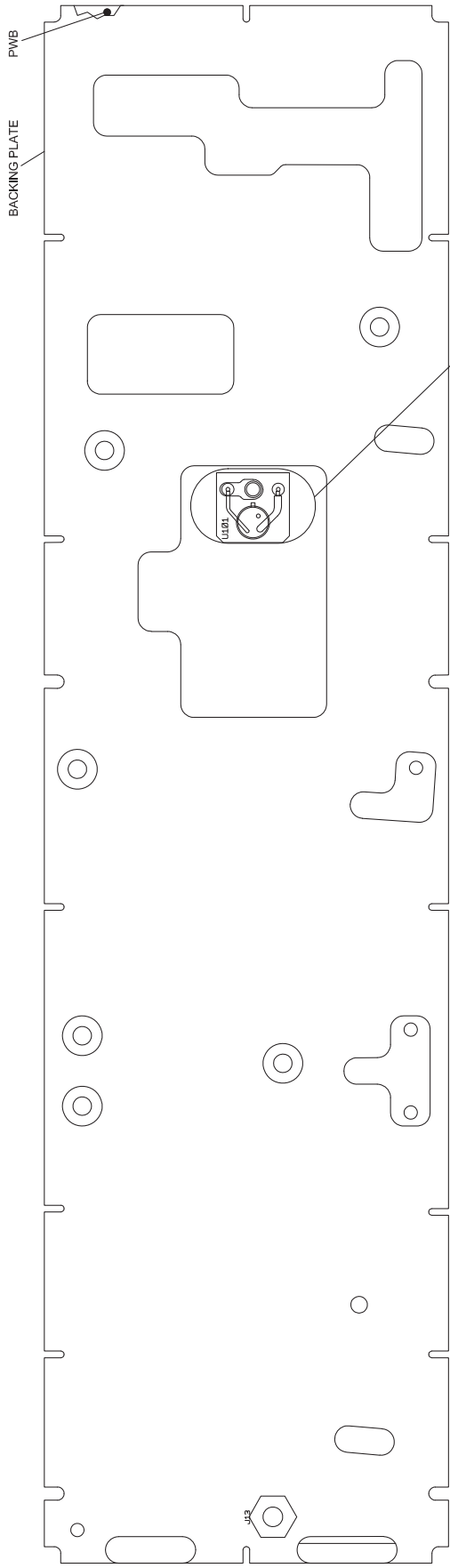


Power Amplifier Circuit Card A2 (CPN 687-0722-004), Maintenance Aid Diagram  
 Figure 2007 (Sheet 2 of 3)/GRAPHIC 34-50-96-99B-042-A01

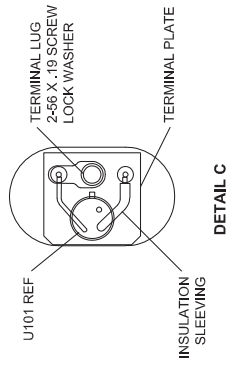
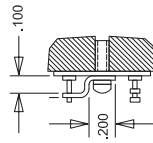




ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



BACKSIDE VIEW



(687-0722-004K 2)  
 CGO-1889-03-A-C03

Power Amplifier Circuit Card A2 (CPN 687-0722-004), Maintenance Aid Diagram  
 Figure 2007 (Sheet 3 of 3)/GRAPHIC 34-50-96-99B-042-A01



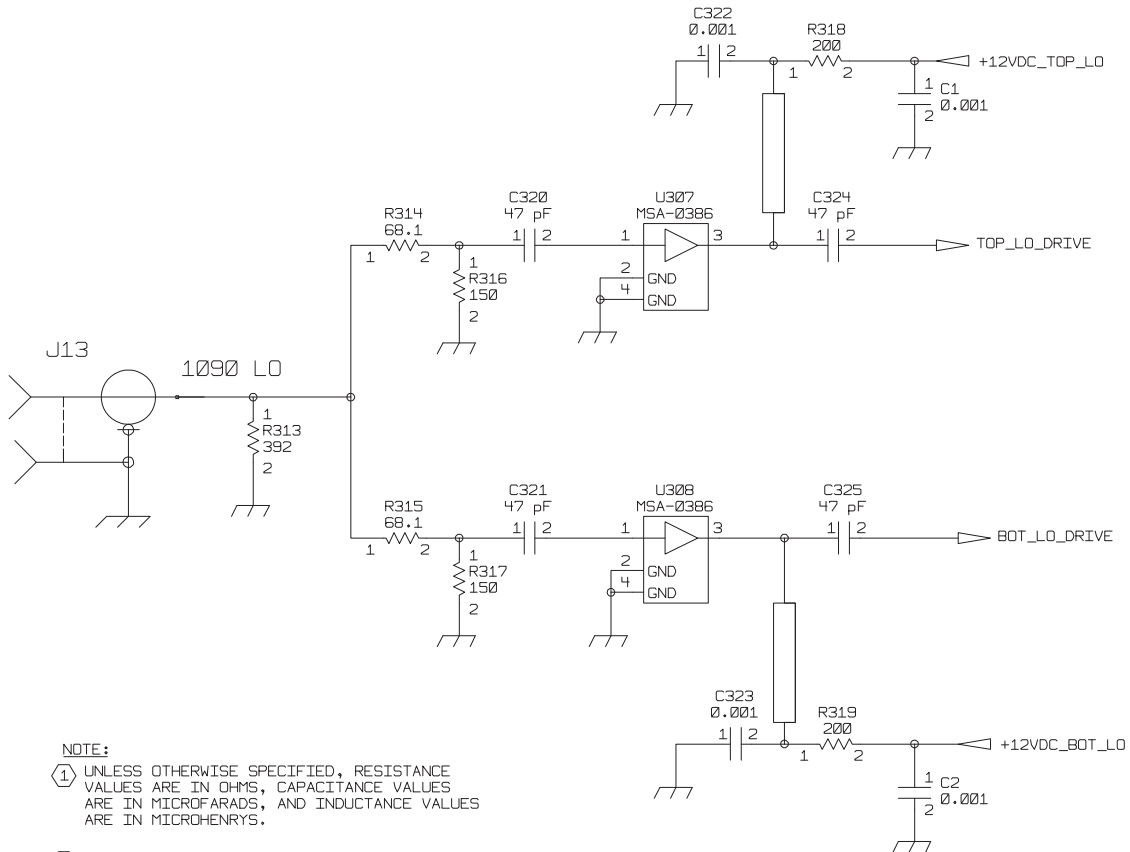








**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
**TDR-94, PART NO 622-9352**



**NOTE:**

- 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 DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.
- ③ THESE PARTS ARE INSTALLED AT A HIGHER LEVEL ASSEMBLY.

(828-7562-004D\_3)  
 TPH6563\_03

Power Amplifier Circuit Card A2 (CPN 687-0722-004), Schematic Diagram  
 Figure 2008 (Sheet 3 of 3)/GRAPHIC 34-50-96-99B-043-A01





**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
TDR-94, PART NO 622-9352

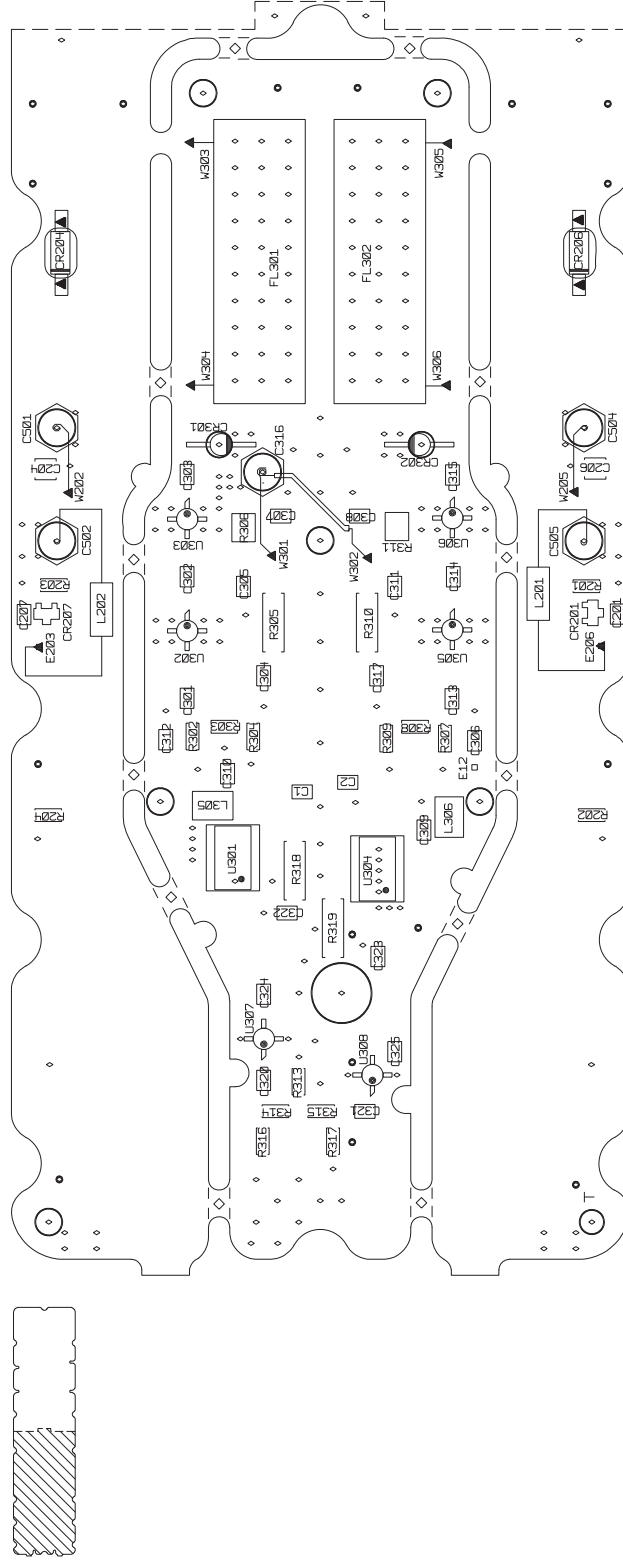
**MAINTENANCE AID/SCHEMATIC CHANGES**

REVISION IDENT (SHEET)	DESCRIPTION OF REVISION AND CAUSE FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY MARKING
	<p>(This sheet will contain maintenance aid and schematic revision data.)</p>		

Power Amplifier Circuit Card A2 (CPN 687-0722-006), Maintenance Aid and Schematic Changes  
Table 2006.1/Table 34-50-96-99A-043-A01



ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



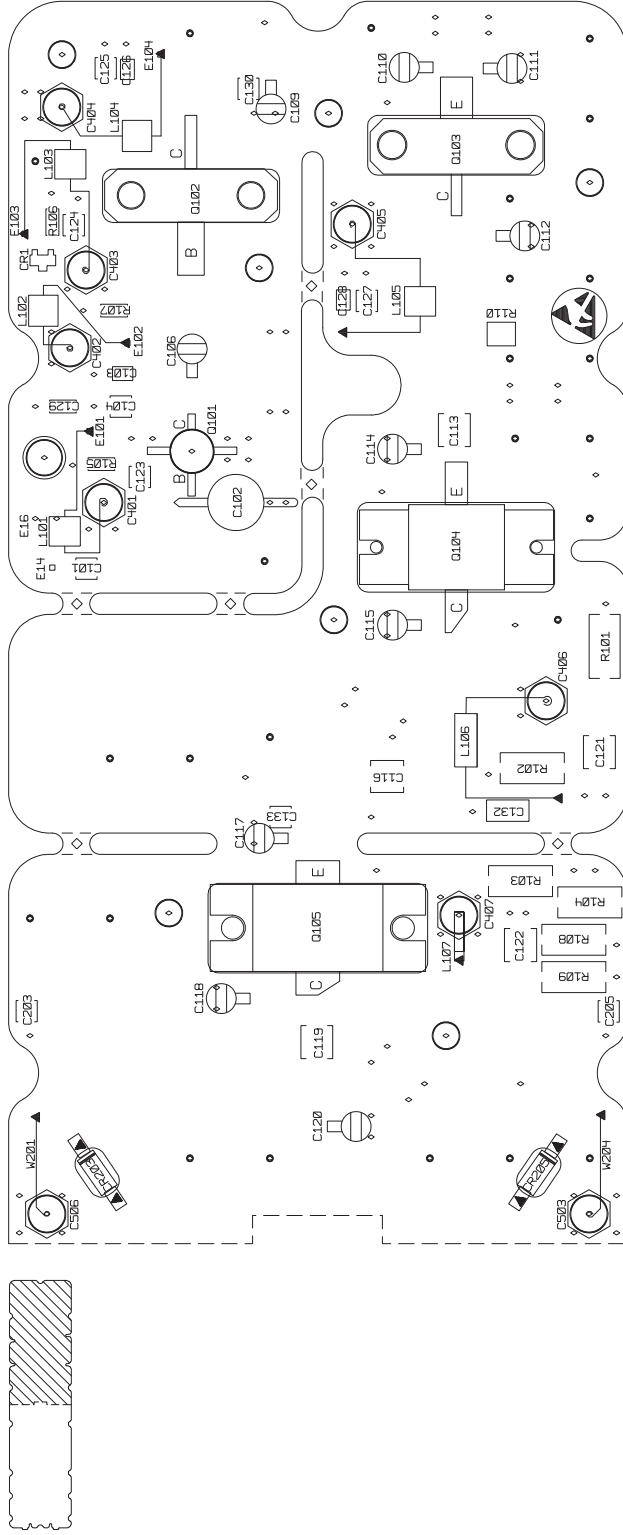
(687-0722-006A.3)  
 TPA68883\_01

PARTIAL TOPSIDE VIEW

Power Amplifier Circuit Card A2 (CPN 687-0722-006), Maintenance Aid Diagram  
 Figure 2008.1 (Sheet 1 of 3) GRAPHIC 34-50-96-99B-096-A01



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 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



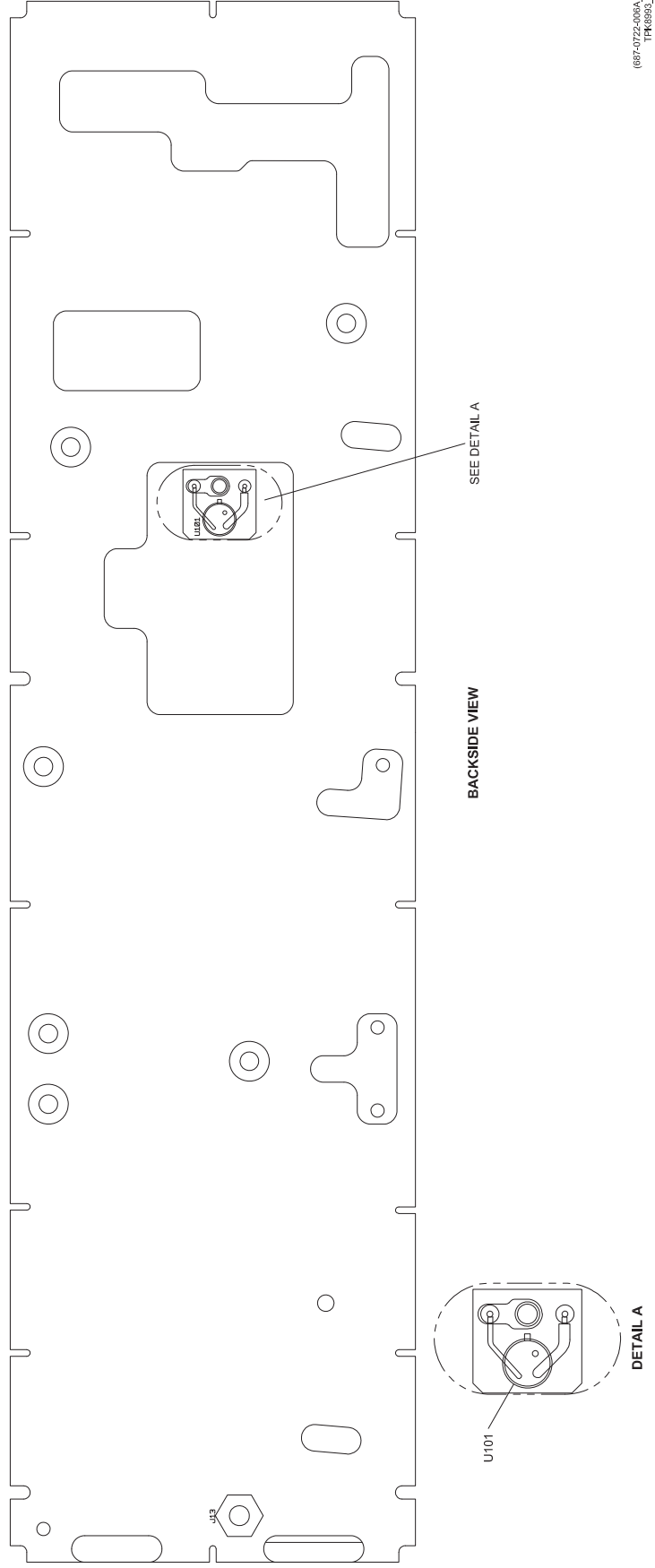
PARTIAL TOPSIDE VIEW

(887-0722-006A\_3)  
 TPK8950\_02

Power Amplifier Circuit Card A2 (CPN 687-0722-006), Maintenance Aid Diagram  
 Figure 2008.1 (Sheet 2 of 3) GRAPHIC 34-50-96-99B-096-A01



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TDR-94, PART NO 622-9352

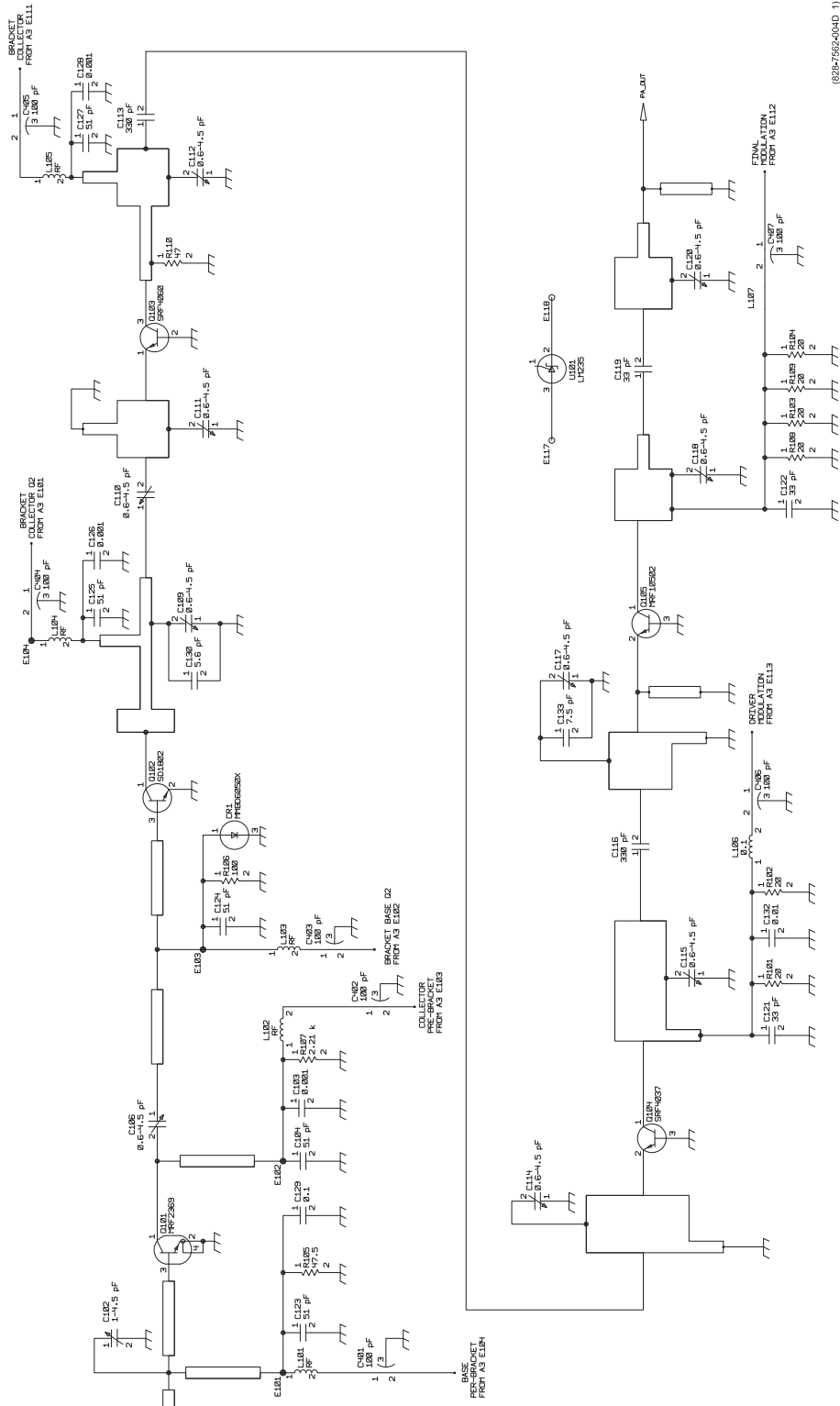


Power Amplifier Circuit Card A2 (CPN 687-0722-006), Maintenance Aid Diagram  
Figure 2008.1 (Sheet 3 of 3) GRAPHIC 34-50-96-99B-096-A01





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 TDR-94, PART NO 622-9352



(625-7952-004D\_1)  
 TFR689201

Power Amplifier Circuit A2 (CPN 687-0722-006), Schematic Diagram  
 Figure 2008.2 (Sheet 1 of 3) GRAPHIC 34-50-96-99B-097-A01











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**COMPONENT MAINTENANCE MANUAL with IPL**  
TDR-94, PART NO 622-9352

**MAINTENANCE AID/SCHEMATIC CHANGES**

REVISION IDENT (SHEET)	DESCRIPTION OF REVISION AND CAUSE FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY MARKING
A	Q210, R245, R244 deleted and U103B added to prevent false low-power diagnostics during self-test. These changes were made before card was released to production.		REV A
B (1,2,3)	Changed Q111, Q204 thru Q206, Q212, Q217, and Q218 from IRFR9212 to IRFR9120; earlier part is not procurable. Also, added R296 and R297 and changed values of R237 and R250.		REV B
C (2)	Made C216 a test select because of variations in the pulse width. Changed part numbers of R237 and R250 (ohm values stayed the same but changed to 1/4W).		REV C
N/A	Replaced Q211 part number; earlier part is not procurable.		REV D
N/A	For future part availability, changed R131 from carbon comp to metal film.		REV E
N/A	Data change only.		REV F
G (1)	Changed Q211 from MTD 8N06E to MTD 15N06V. The transistor being replaced is obsolete.		REV G
H (2)	Q106 is changed from IRF540 to IRF540N. The IRF540 transistor is no longer procurable.		REV H
N/A	Internal documentation change only.		REV J
K (2)	Q106 is changed back to IRF540 because the IRF540N is now obsolete.		REV K

Modulator Circuit Card A3 (CPN 687-0723-004), Maintenance Aid and Schematic Changes  
Table 2007/Table 34-50-96-99A-018-A01

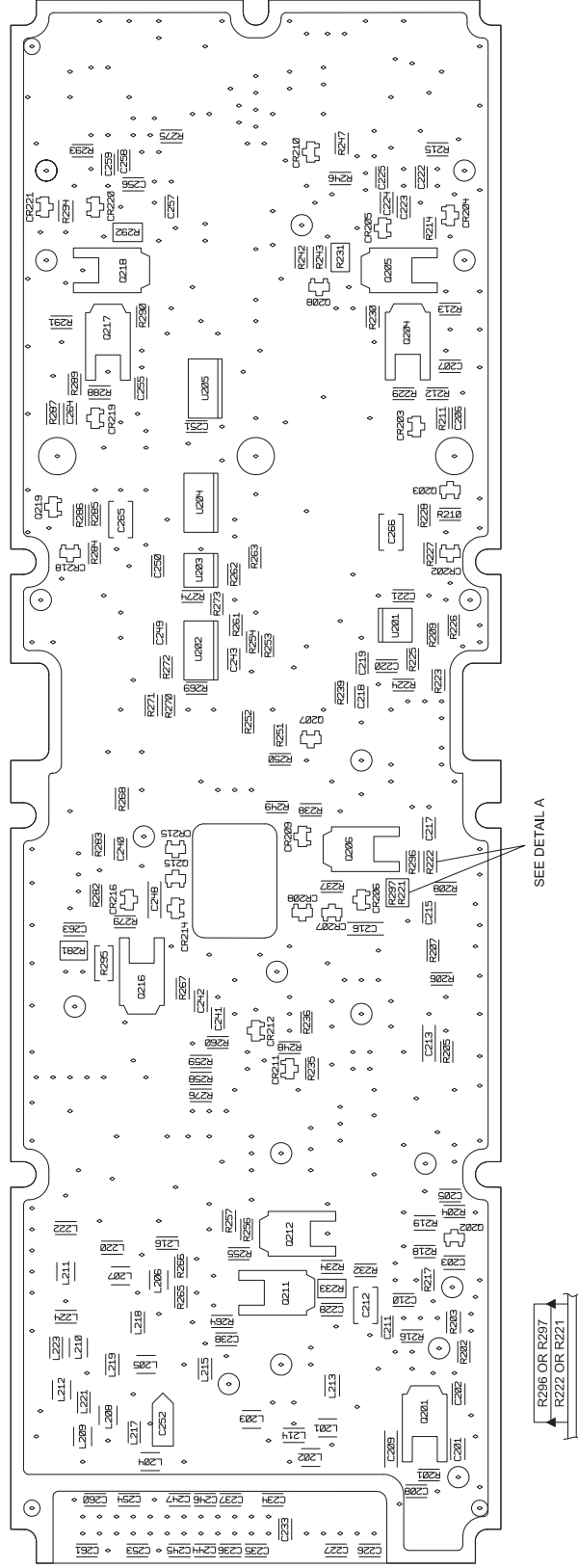








ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



(89-4723-004K\_6)  
 CGO-5388-02-AC-02

SEE DETAIL A

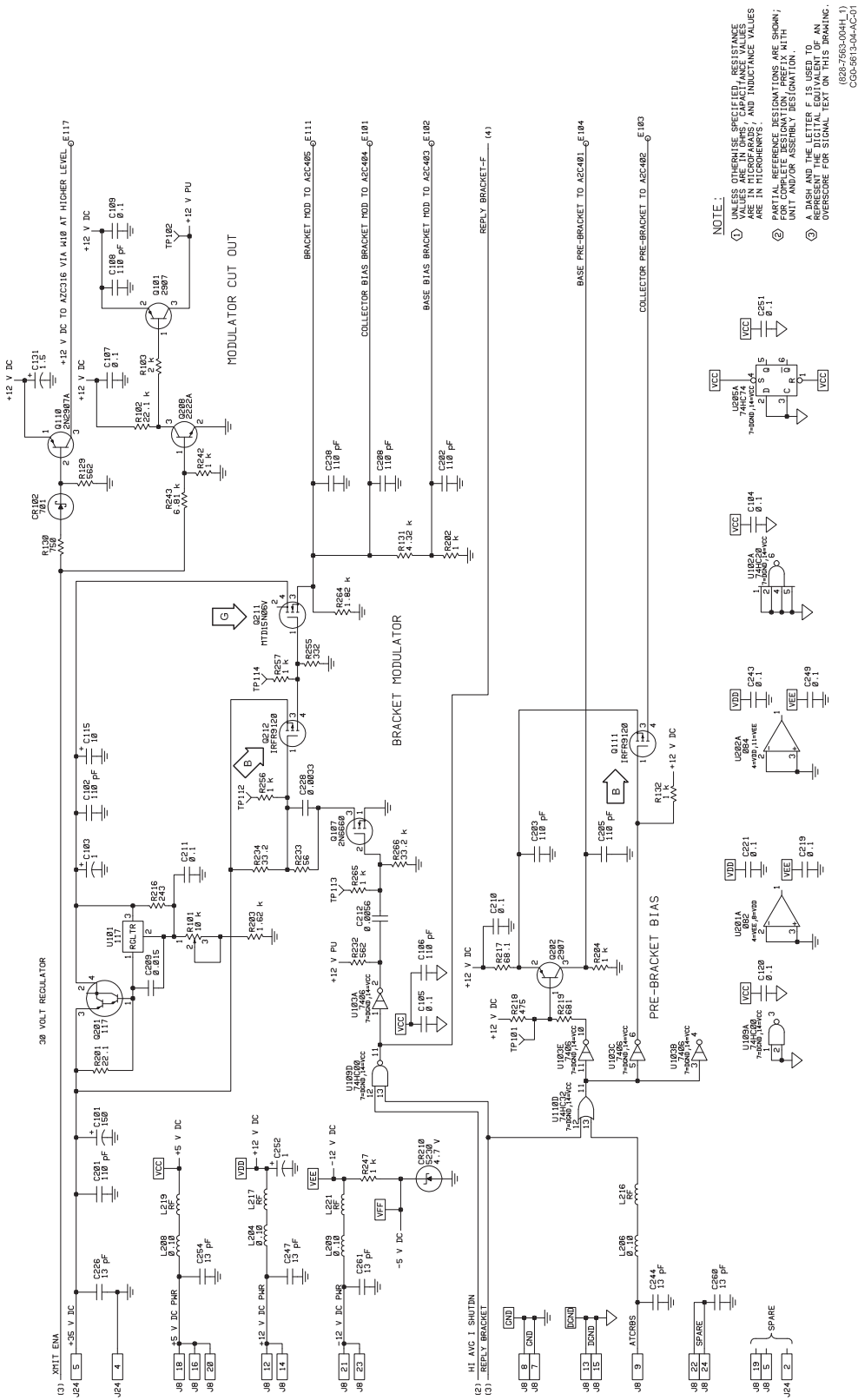
DETAIL A

BACKSIDE VIEW

Modulator Circuit Card A3 (CPN 687-0723-004), Maintenance Aid Diagram  
 Figure 2009 (Sheet 2 of 2) GRAPHIC 34-50-96-99B-044-A01



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 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



Modulator Circuit Card A3 (CPN 687-0723-004), Schematic Diagram  
 Figure 2010 (Sheet 1 of 4) GRAPHIC 34-50-96-99B-045-A01

NOTE:  
 ① UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, KILOHMS, AND RESISTANCE VALUES ARE IN MICROHMS, AND RESISTANCE VALUES ARE IN MICROHMS.  
 ② PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE ASSEMBLY DESIGNATION, WITH UNIT, PART OR ASSY, SEE DRAWING.  
 ③ A DASH AND THE LETTER E IS USED TO REPRESENT THE DIGITAL EQUIVALENT OF AN OVERSCORE FOR SIGNAL TEXT ON THIS DRAWING.

(628-7565-004H.1)  
 CGP-561304-AC-01





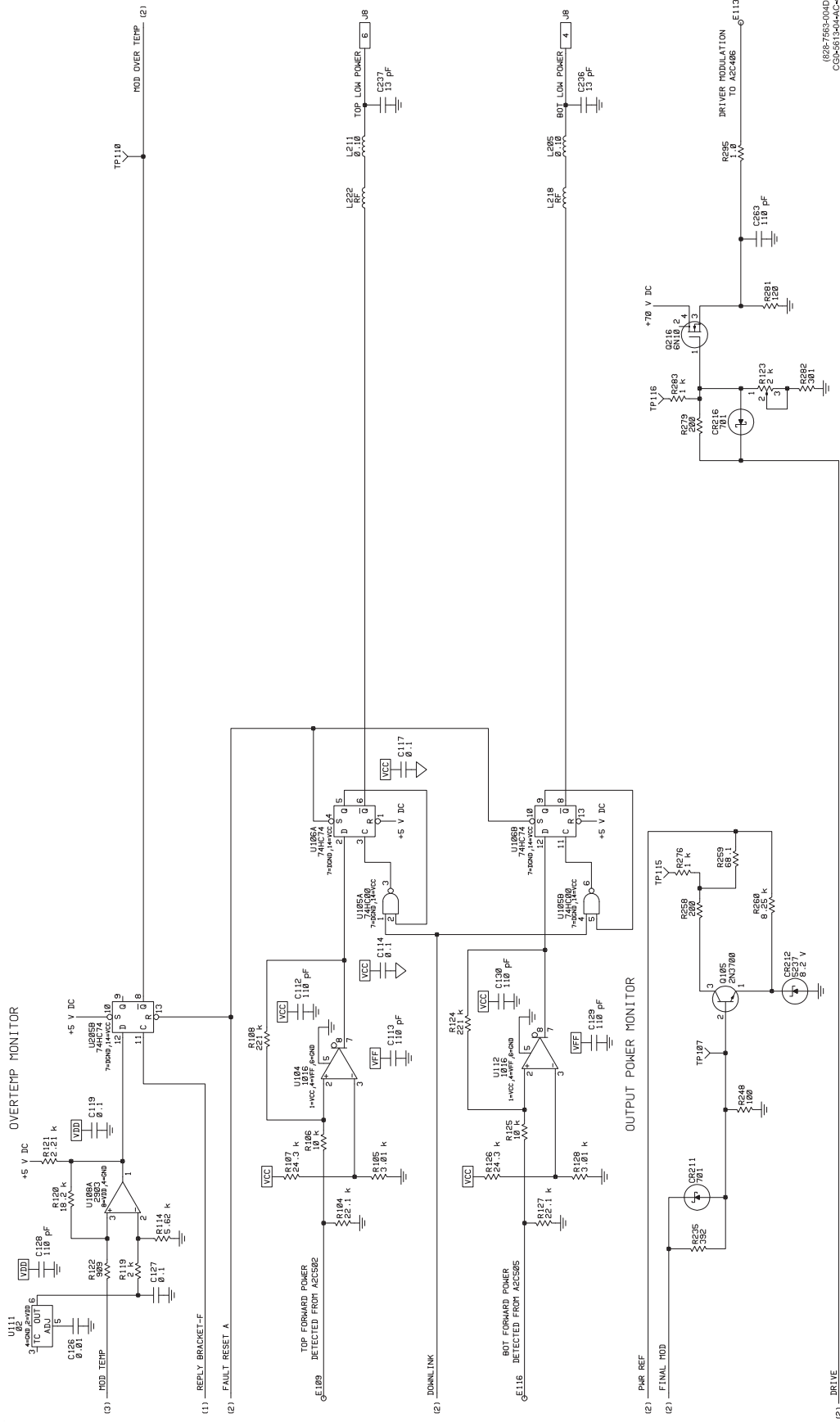








ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



(687-7553-004D)  
 CS56-561300-AC-4

Modulator Circuit Card A3 (CPN 687-0723-004), Schematic Diagram  
 Figure 2010 (Sheet 4 of 4) GRAPHIC 34-50-96-99B-045-A01



**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
TDR-94, PART NO 622-9352

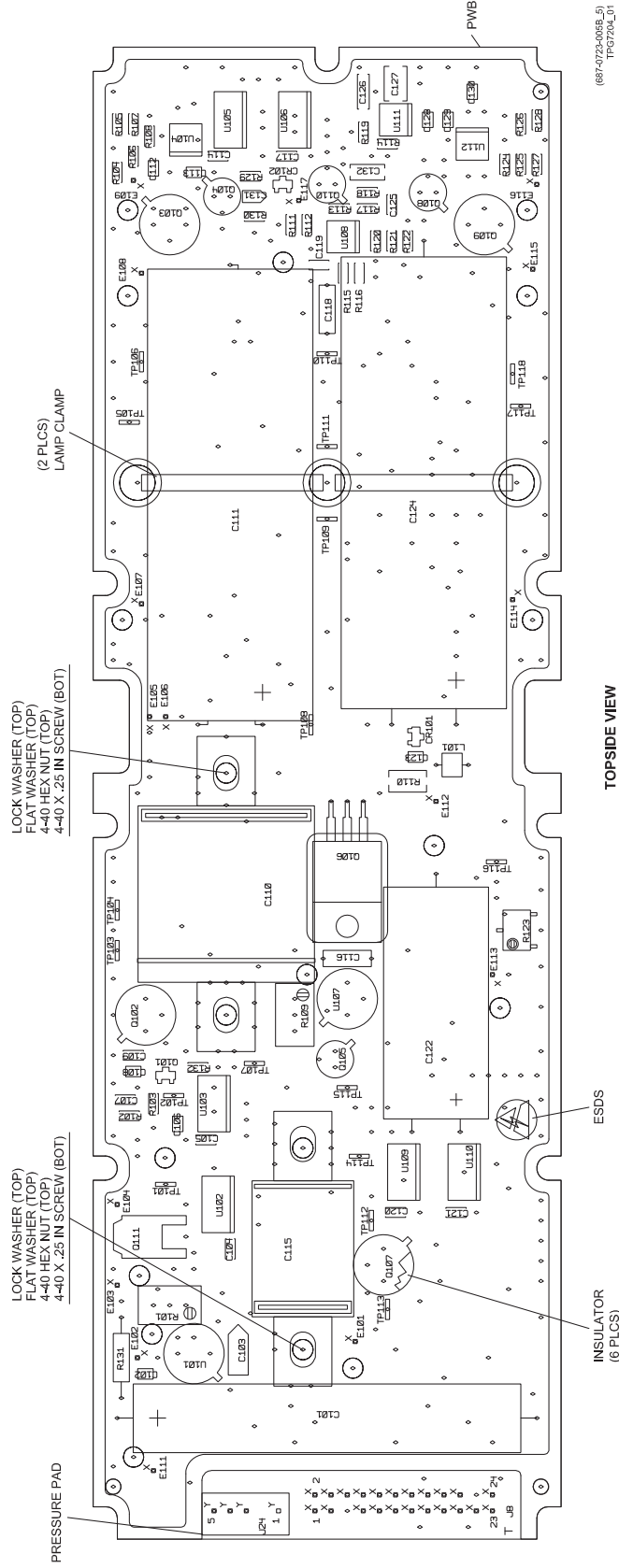
**MAINTENANCE AID/SCHEMATIC CHANGES**

REVISION IDENT (SHEET)	DESCRIPTION OF REVISION AND CAUSE FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY MARKING
NA	Initial release.		REV A
NA	Documentation change only.		REV B
C (2)	Changed Q106 from IRF540N (non-procurable) to IRF540.		REV C

Modulator Circuit Card A3 (CPN 687-0723-005), Maintenance Aid and Schematic Changes  
Table 2008/Table 34-50-96-99A-019-A01



ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352

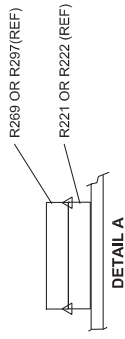


Modulator Circuit Card A3 (CPN 687-0723-005), Maintenance Aid Diagram  
 Figure 2011 (Sheet 1 of 2)/GRAPHIC 34-50-96-99B-046-A01

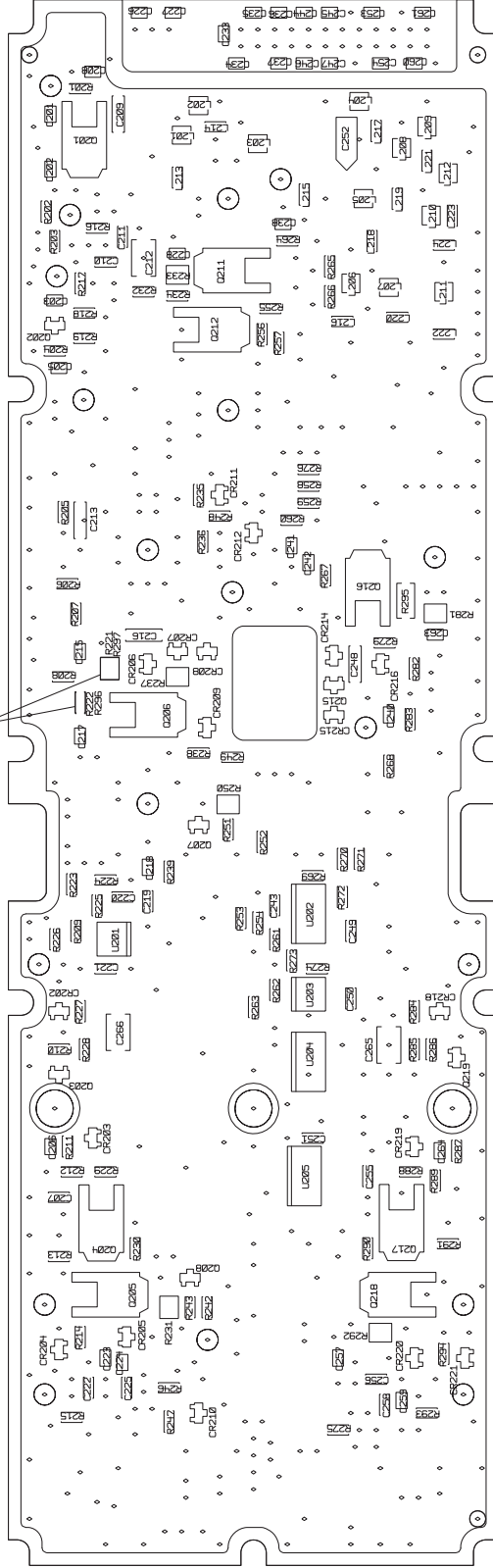




ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



SEE  
 DETAIL A



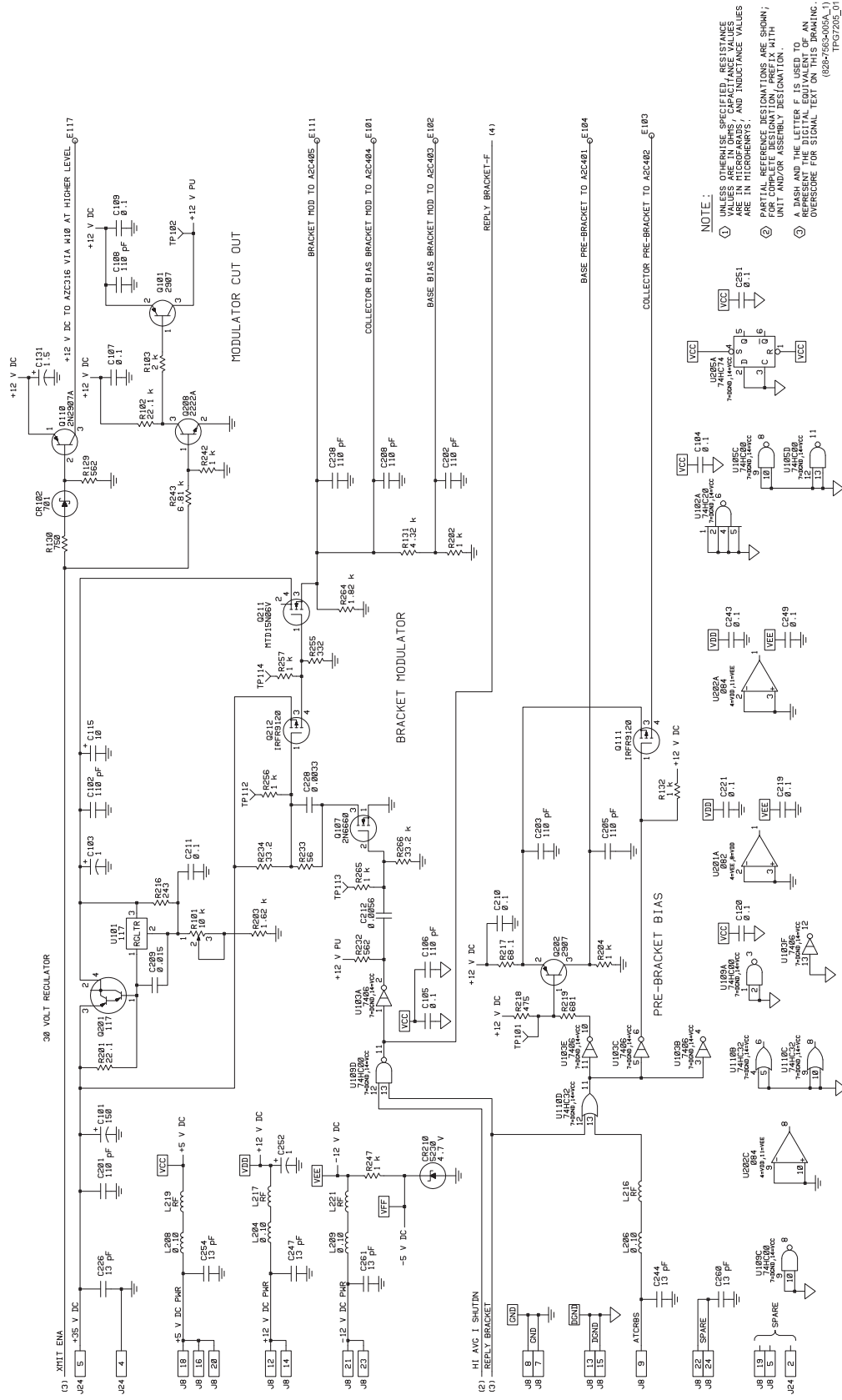
BACKSIDE VIEW

(88F-0723-005B\_6)  
 TPG7204\_02

Modulator Circuit Card A3 (CPN 687-0723-005), Maintenance Aid Diagram  
 Figure 2011 (Sheet 2 of 2)/GRAPHIC 34-50-96-99B-046-A01



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 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



Modulator Circuit Card A3 (CPN 687-0723-005), Schematic Diagram  
 Figure 2012 (Sheet 1 of 4) GRAPHIC 34-50-96-99B-047-A01





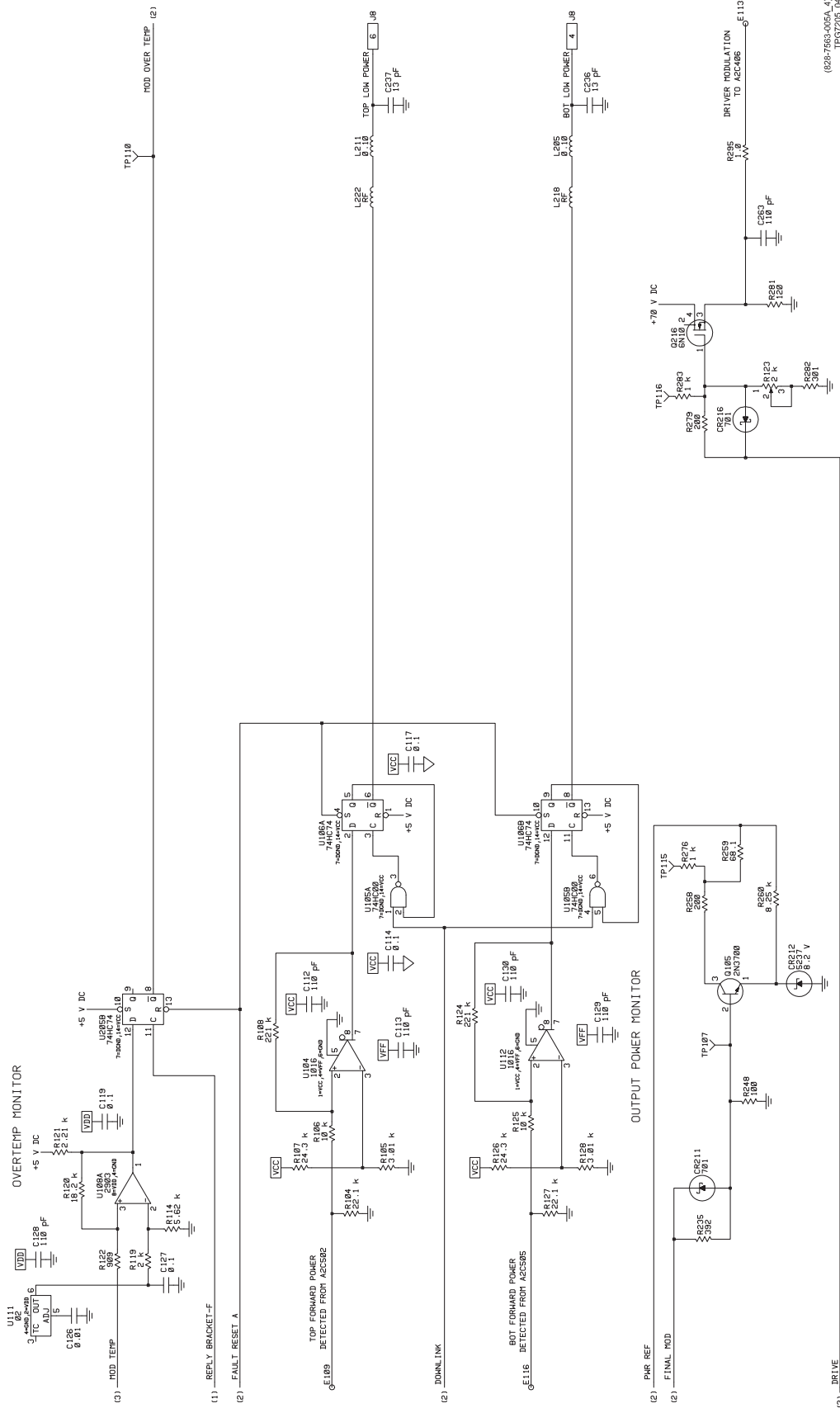








ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



(6287-563-005A.4)  
 TPG7206\_04

Modulator Circuit Card A3 (CPN 687-0723-005), Schematic Diagram  
 Figure 1012 (Sheet 4 of 4) GRAPHIC 34-50-96-99B-047-A01



**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
TDR-94, PART NO 622-9352

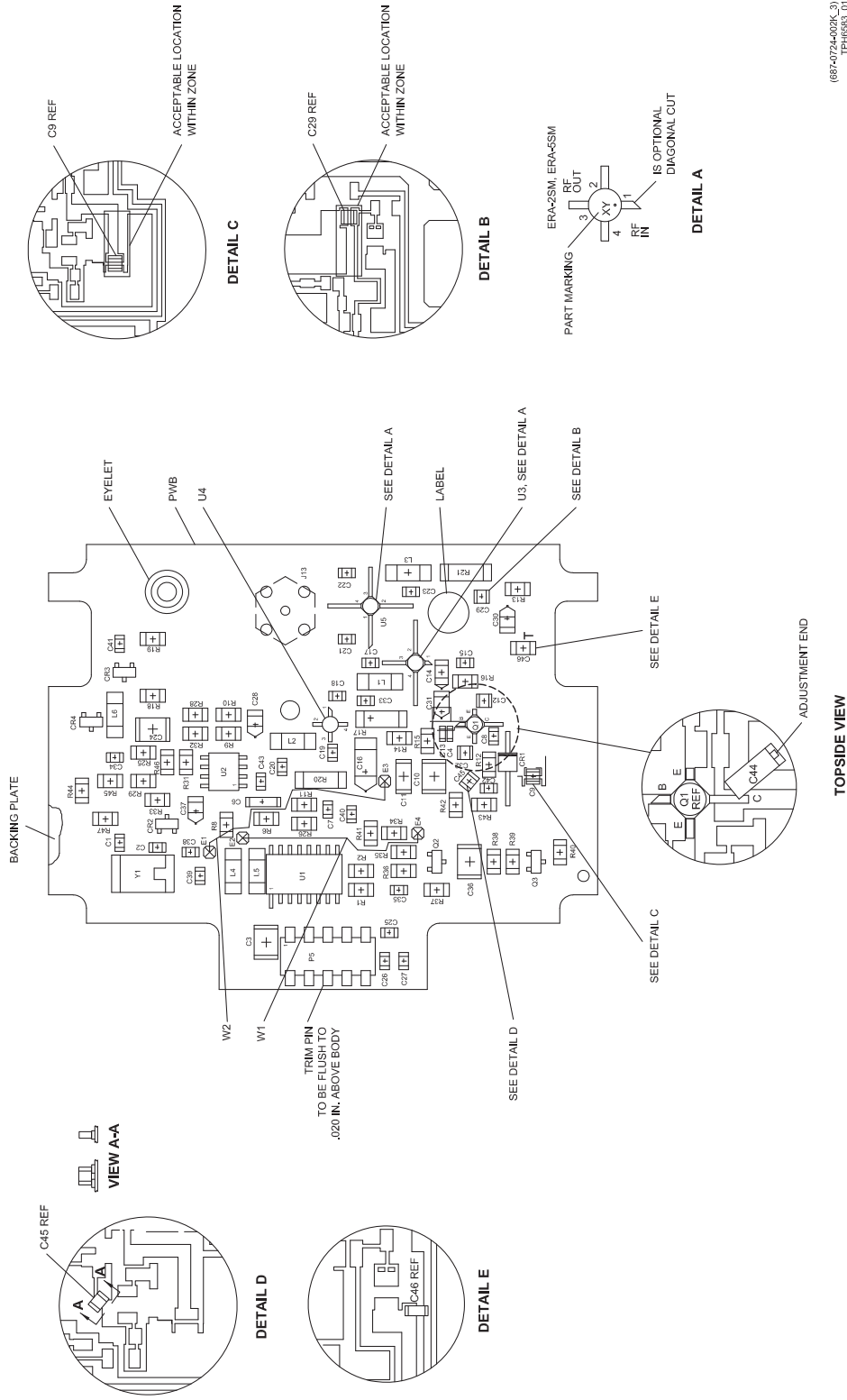
**MAINTENANCE AID/SCHEMATIC CHANGES**

REVISION IDENT (SHEET)	DESCRIPTION OF REVISION AND CAUSE FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY MARKING
N/A	Data changes only.		REV A and B
N/A	Production process change only.		REV C
D	Changed following components to improve VCO stability: R43 from 47.3 to 10 k $\Omega$ (705-3535-020) R11 from 1.62 to 1 k $\Omega$ (705-3535-200) R6 from 392 $\Omega$ to 3.57 k $\Omega$ (705-3537-490) C43 from 1000 to 330 pF (913-3667-200) C15 from 2.7 to 3.9 pF (914-3500-060) C8 from 2.7 to 6.8 pF (914-3500-100) R8 from 7.5 to 8.25 k $\Omega$ (705-3537-780) C6 from 0.018 to 0.022 $\mu$ F (913-3670-470)		REV D
N/A	Changed following components to standard parts: R18, R19, R42, R47, and R48.		REV E
N/A	Production process changes only.		REV F and G
J (1)	Changed U3 and U5 from CGY-40 to ERA-55M (U3) and ERA-25M (U5). Changed R21 from 121 $\Omega$ to 200 $\Omega$ . Changed CPN of L1 and L3 (Inductance value does not change). Changed CPN of C17, C21, C22, C41. Capacitor values do not change. Capacitor C4 0.1 $\mu$ F and C14 3.9 pF were added.		REV J
K (1)	Added capacitors C45 and C46 to eliminated spurs on synthesizer circuit card.		REV K

Synthesizer Circuit Card A4 (CPN 687-0724-002), Maintenance Aid and Schematic Changes  
Table 2009/Table 34-50-96-99A-020-A01



**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
 TDR-94, PART NO 622-9352

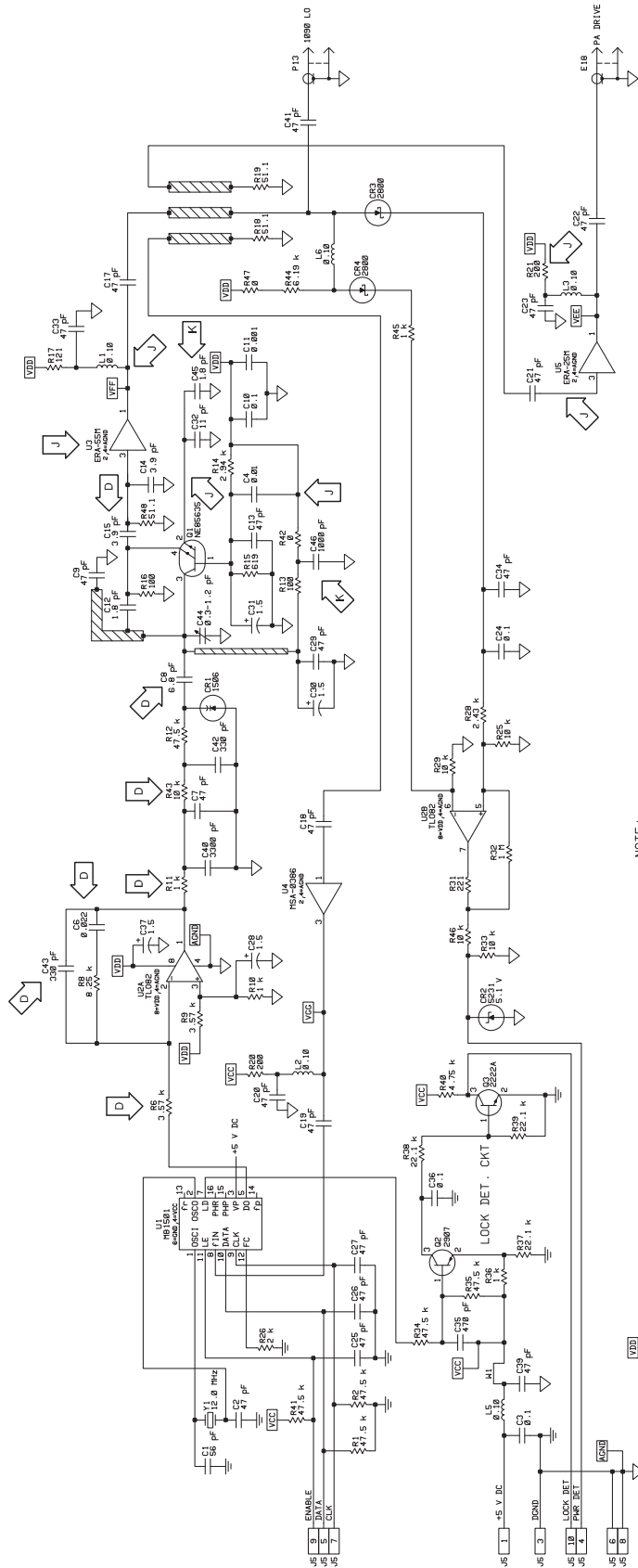


(687-0724-002, 3)  
 (PAGES 21)

Synthesizer Circuit Card A4 (CPN 687-0724-002), Maintenance Aid Diagram  
 Figure 2013/GRAPHIC 34-50-96-99B-048-A01



ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352



- NOTE:
- ① UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN PICOFARADS, AND INDUCTANCE VALUES ARE IN MICROHENRYS.
  - ② PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH THE IC PART NUMBER (IC PART NO.).
  - ③ UNLESS OTHERWISE SPECIFIED, ALL VALUES REPRESENT THE DIGITAL EQUIVALENT OF AN OVERSCORE FOR SIGNAL TEXT ON THIS DRAWING.

▽ = AGND = DONG

(828-7564-002D-1)  
 CG9A-557001A-C-1

Synthesizer Circuit Card A4 (CPN 687-0724-002), Schematic Diagram  
 Figure 2014/GRAPHIC 34-50-96-99B-049-A01





**ROCKWELL COLLINS**  
**COMPONENT MAINTENANCE MANUAL with IPL**  
TDR-94, PART NO 622-9352

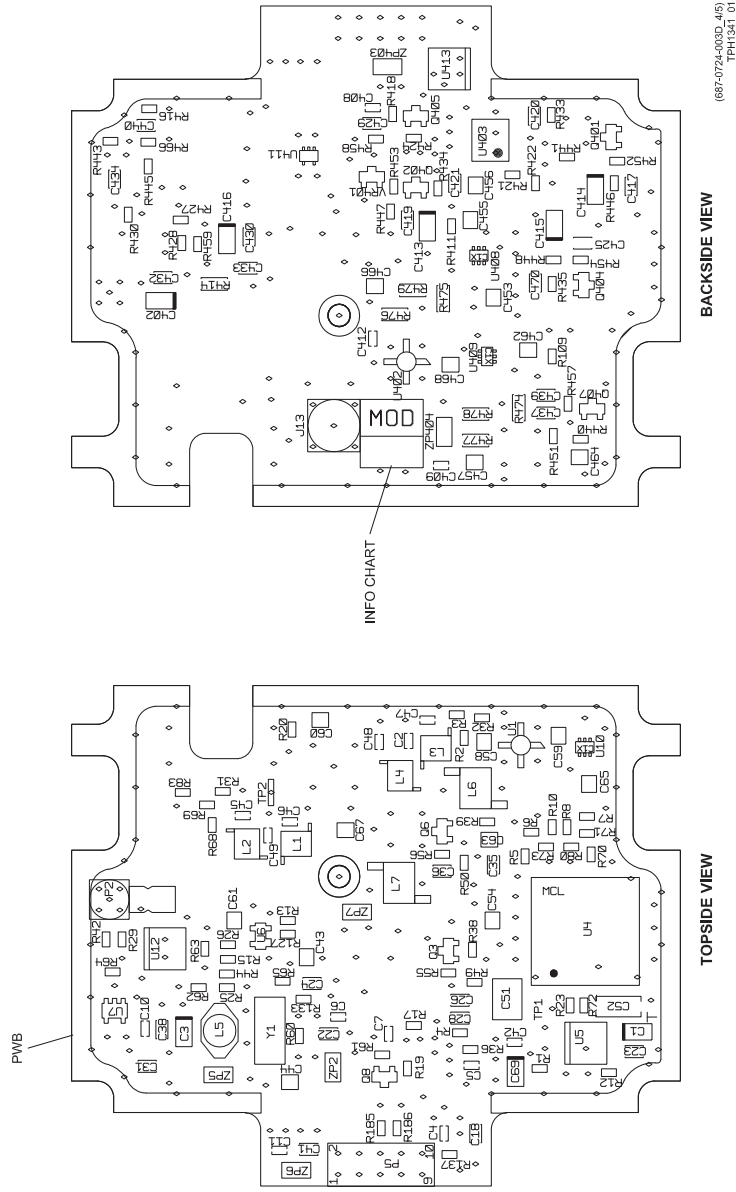
**MAINTENANCE AID/SCHEMATIC CHANGES**

REVISION IDENT (SHEET)	DESCRIPTION OF REVISION AND CAUSE FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY MARKING
N/A	Implemented circuit card into production.		REV A
N/A	Internal documentation changes only.		REV B and C
N/A	Changed CPN of U413. The new U413 uses a different AT90S2313. EEPROM device.		REV D

Synthesizer Circuit Card A4 (CPN 687-0724-003), Maintenance Aid and Schematic Changes  
Table 2010/Table 34-50-96-99A-021-A01



ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352

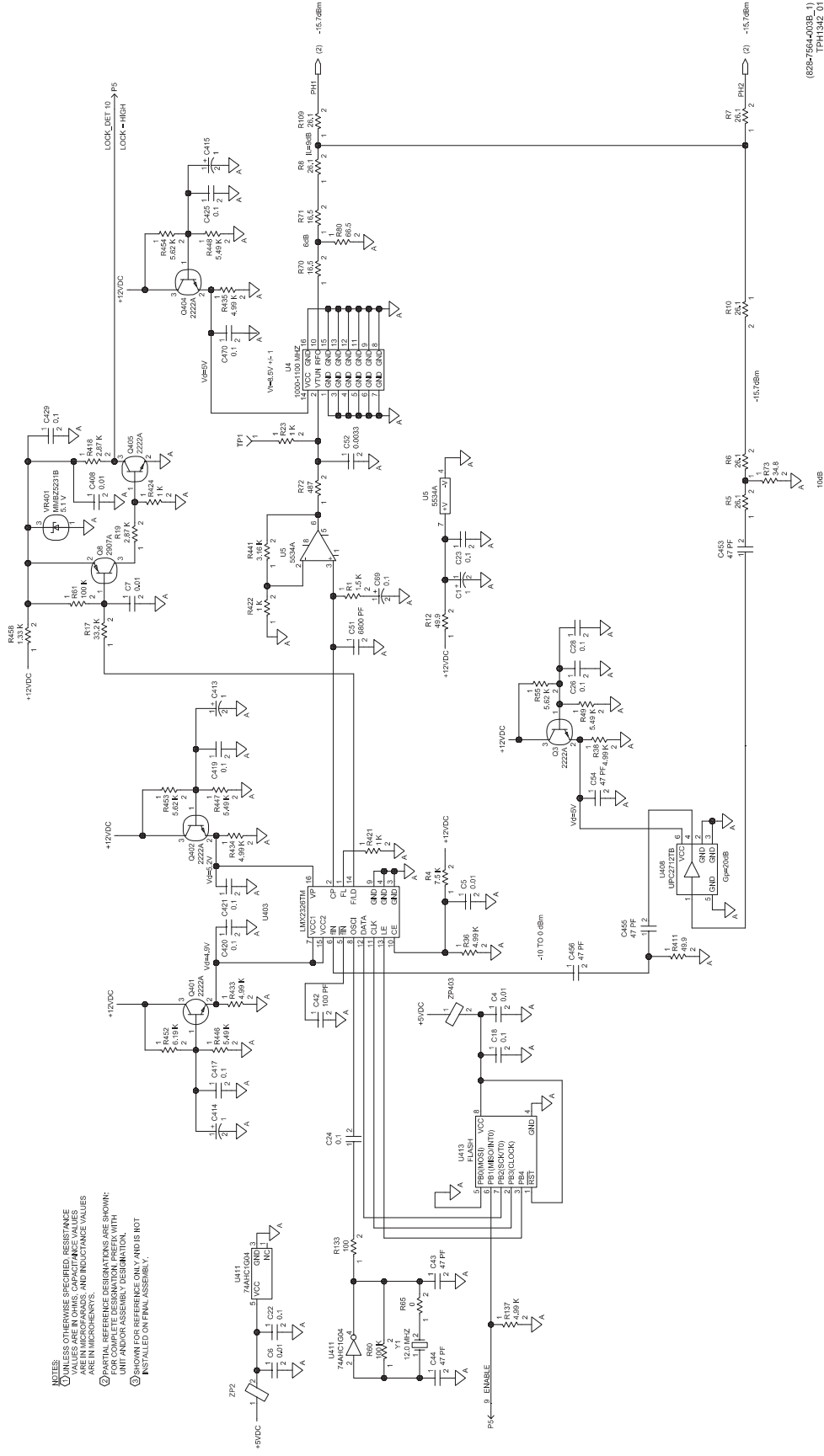


Synthesizer Circuit Card A4 (CPN 687-0724-003) Maintenance Aid Diagram  
 Figure 2015/GRAPHIC 34-50-96-99B-050-A01



ROCKWELL COLLINS  
 COMPONENT MAINTENANCE MANUAL with IPL  
 TDR-94, PART NO 622-9352

- NOTES:  
 ① UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS, AND INDUCTANCE VALUES ARE IN MICROHENRIES.  
 ② PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION REFER WITH UNIT AND/OR ASSEMBLY DESIGNATION.  
 ③ SHOWN FOR REFERENCE ONLY, AND IS NOT INSTALLED ON FINAL ASSEMBLY.



Synthesizer Circuit Card A4 (CPN 687-0724-003), Schematic Diagram  
 Figure 16 (Sheet 1 of 2)/GRAPHIC 34-50-96-99B-051-A01

