Honeywell

MAINTENANCE MANUAL

BENDIX/KING®

KTS 152

TEST SET

MANUAL NUMBER 006-15630-0007
REVISION 7 JANUARY, 2002

WARNING
Prior to the export of this document, review for export license requirement is needed.

REVISION HISTORY

KTS 152 Maintenance Manual

Part Number: 006-15630-XXXX

For each revision, add, delete, or replace pages as indicated.

REVISION No. 7, January 2002

ITEM	ACTION
All pages	Full Reprint, new manual

Revision 7 creates a new stand-alone manual for the KTS 152 which was extracted from revision 6 of the KCS 55/55A maintenance manual, (P/N 006-05111-0006). Any revisions to the KTS 152, beginning with revision 7, will not be a part of the KCS 55/55A manual.

THIS PAGE IS RESERVED

TABLE OF CONTENTS

SECTION IV
THEORY OF OPERATION

SECTION V
MAINTENANCE

SECTION VI
ILLUSTRATED PARTS LIST

LIST OF ILLUSTRATIONS

EARLY UNITS - S/N 1199 AND BELOW

CURRENT UNITS - S/N 1200 AND ABOVE

KTS 152 SCHEMATICS

SECTION IV
THEORY OF OPERATION

4.1 GENERAL

The KTS 152 test set is designed to test the KG 102, KG 102A and the KSG 105 Directional Gyros. Two cables are provided with the set. One is used to connect the unit under test to the main unit connector on the test set and the other is used to connect the gyroscope itself to the tester where it is internally strapped to the Main Unit Connector and back to the Pigtail Connector on the unit. The two hookup configurations are shown below.

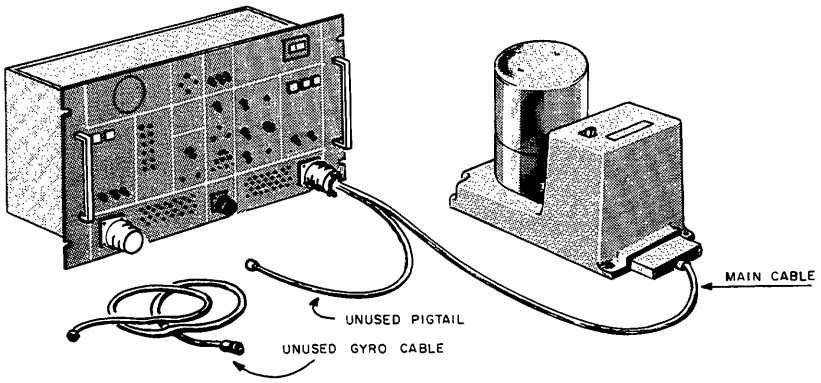


FIGURE 4-1A TESTER HOOK-UP, ASSEMBLED UNIT

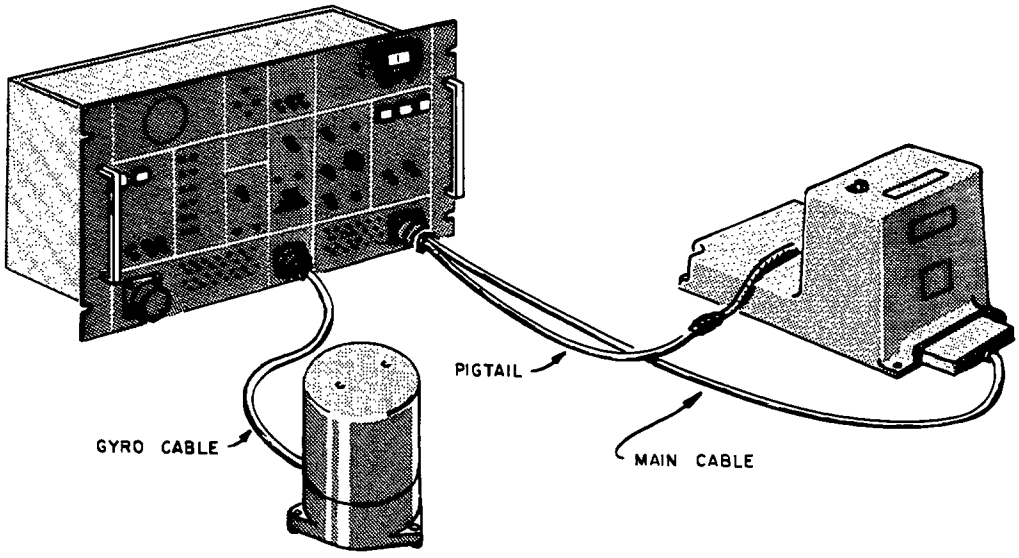


FIGURE 4-1B TESTER HOOK-UP, GYRO ISOLATED

4.2 POWER INPUT REQUIREMENTS

Provisions are made on the rear of the tester for three different power sources.

Of primary importance is the 115VAC 400Hz supply. This source is required to supply power to the tester itself and to the KSG 105 gyro when it is being tested. As such, it is always required regardless of the type of unit under test.

The KG 102 and KG 102A require either +14VDC or +28VDC. Only the one being used need be connected to the tester, however, both may be plugged into the rear of the tester if available. A front panel switch selects the desired one. Neither of these sources is- required when testing the KSG 105, however, they may remain connected to the tester if desired.

Each of the DC sources should be capable of supplying a minimum of 4 amps continuously and the 115VAC source should have a 50VA capability.

4.3 TEST PANEL POWER CONTROLS

Power Control is divided into two sections. First, power to the test set is controlled with the two INPUT POWER Switches. One is used to switch the 115VAC and the other is used to switch the +14 or +28VDC if required. These sources are fused individually at the tester input and appropriately annunciated. Test set power is supplied by the 115VAC and is controlled by the INPUT POWER Switch. If a KSG105 Unit is being tested, the 14/28VDC INPUT POWER Switch may remain OFF, however, no damage will, result if it is switched ON.

Secondly, power to the individual unit under test is controlled with the UNIT POWER Switches. This section of the tester consists of four switches, two fuses and two annunciators. Operation of the KSG 105 switch will supply 115VAC power to Pins X and r of the KSG 105 Unit Connector if the unit is properly connected to the tester. If it has been improperly connected to the KG 102/A Connector, an internal relay will prevent power from being applied to either connector. This situation will be annunciated by the illumination of the IMPROPER CONNECT lamp and failure of the KSG 105 lamp to illuminate. A 26VAC switch is used in conjunction with the KSG 105 and is interlocked in the manner described above. This switch is used to excite the synchro transmitters internal to the KSG 105 and to phase lock the tester demodulator used to position the tester heading card to the position commanded by these transmitters. Power to the KG 102/A is controlled by the 14/28VDC and +14-28V switches. The 14V - 28V switch selects the supply corresponding to the power selector switch on the unit itself. This source must, of course, be plugged into the proper jacks at the rear of the tester. As with the KSG 105, if the KG 102/A is plugged into the wrong front panel connector, the IMPROPER CONNECT lamp will light and power will not be supplied to either connector.

An additional interlock feature is provided to prevent unit damage if the 14V - 28V selector is in the 28V position and the unit selector is in the 14V position. This configuration results in excessive current draw by the KG 1021A and imminent damage to the unit. An overload circuit is incorporated into the tester to detect this high current level and operate a relay designed to remove power from the Connector. Operation of this relay causes the IMPROPER CONNECT lamp to illuminate and the KG 102/A lamp to go OFF. The tester will remain latched in this configuration until the KG 102/A, 14/28VDC UNIT POWER Switch is cycled OFF and then ON. Naturally the 14/28V discrepancy should be cleared prior to reapplication of power. Even though this interlock removes power shortly after it is applied, intentional "testing" of this circuit will eventually degrade the components in both the tester and the KG 102/A.

4.4 VOLTAGE MONITOR

This section provides front panel access to input 14/28V power along with the internally generated +12VDC, +5VDC and 26VAC. These voltages will be present when the INPUT POWER switches are operated. Standard three-quarter inch spaced banana jacks are provided along with redundant Pin jacks for each voltage. All of the black ground jacks are connected together and to the tester chassis. This ground is also common to the 14/28V input sources and the ground buss for all of the internal tester circuitry. The only circuit not connected to this ground in any way is the 115VAC input line or the 115VAC power to the KSG 1-05 Connector Pins X and r.

THIS PAGE IS RESERVED

SECTION V
TESTING

5.1 TESTING THE KG 102/A

NOTE:
When testing a KG 102, (as opposed to a KG 102A) it is necessary to jumper KG 102/A front panel pin t to ground in order to achieve proper auto slaving action. This jumper is not required when testing the KG 102A as the ground is provided internal to that unit.

Initial testing of the KG 102/A should be performed with the unit assembled and connected as shown in figure 4-1A. Both of the INPUT POWER Switches may be turned on at this point along with the +14/28V KG 102/A UNIT POWER Switch.

During gyro spin-up, the KG 102/A HDG and AP VALID lamps will remain OFF and the Compass Card will not rotate. If the KA 51 slave button is depressed however, and one of the flux value simulator switches is ON, the card will Fast Slave to the appropriate heading. The system will remain in Fast Slave until the slaving error goes to zero and the gyro motor has reached operating speed. Each flux value switch corresponds to a specific heading as indicated in the table below:

Switch ON	Heading
X	360 deg.
Y	120 deg.
Z	240 deg.
X-Y	60 deg.
X-Z	300 deg.
Y-Z	180 deg.

At the conclusion of the Fast Slave and Spin-up Cycles, the HDG and AP valid lamps will come ON. A diamond shaped array of lamps is provided to depict each quarter degree step of the Compass Card. As the gyro is manually rotated, or as the system performs an auto or manual slave function, "rotation" of these lamps should conform to rotation of the Compass Card.

The remaining tester function, as it involves the assembled unit, is the WAVEFORM ANALYSIS feature. This section is designed to detect a faulty gyroscope by measuring the time between Compass Card steps when the unit is being rotated at thirty degrees per second. Normally the step interval is 8.33ms at this rate, however, if the gyro waveform is unsymmetrical and falls below 5.0ms, the WAVEFORM FAIL lamp will come on. Since this test requires an accurate turntable , it is generally performed with the gyroscope isolated from the base assembly and mounted on the table with the connections made through the turntable slip rings. A CAL TP is located on the front panel to monitor the 5.Oms positive pulse each time a Compass Card step occurs. This pulse width is factory adjusted with a potentiometer located inside the tester.

5.2 TESTING THE KSG 105

As with the KG 102/A, the KSG 105 assembled unit should be connected to the tester as shown in Figure 4-1A except that the KSG 105 Connector must be used. While testing the KSG 105, the KG 102/A 14/28VDC INPUT and UNIT power switches may remain OFF and the DC supplies need not be connected to the rear of the tester. Operation of the 115VAC UNIT POWER Switch will supply power to the KSG 105 and placing the 26VAC switch ON will excite the heading transmitter synchros and cause the tester Compass Card to align with the synchro selected by the HEADING TRANSMITTER Switch. Unlike the KG 102/A hook-up, the Compass Card does not respond to KSG 105 rotation on a step-for-step basis as it does with the KG 102/A. Rather it becomes a part of a servo follower system where a synchro error voltage is translated into a stepper motor format in the tester to ultimately drive the Card. For this reason it is possible for the Compass Card to fall behind the gyro if it is rotated faster than the maximum slewing rate of the Card. This rate is approximately 30 deg/Sec. When the gyro rotation has stopped, however, the Card will continue to rotate and display the correct heading.

Slaving operation is identical to that described for the KG 102/A, as is the HDG and AP VALID functions.

5.3 TESTING THE GYROSCOPE

With the system connected as shown in Figure 4-1B,the units can be operated as described above, with the added features of full access to the gyro connector pins, a current interrupt switch to measure gyro drift during a momentary power failure, a gyro current measuring port and means to interject a simulated gyro signal into the system. With the GYRO Switch in the GYRO position, the output signals from the gyroscope are patched through the tester and back to the unit. When the switch is placed in the GYRO SIM position, however, a simulated gyroscope signal controlled by the GYRO SIMULATOR section of the tester is transmitted to the Main Unit. The GYRO Spin Motor is still driven from the Main Unit supply and not from the tester.

The simulator controls consist of an ON-OFF Switch, direction control, rate adjust controls and a single revolution control. With the possible exception of the FREE RUN - 1 REV Switch and the RESET Switch, these controls should be self explanatory. When the switch is placed in the I-REV position and the RESET button depressed, 1440 steps will be transmitted to the Main Unit. This corresponds to 360 degrees of Card rotation and is used primarily with the KSG 105 to determine if the internal stepper motor has skipped any of the incoming gyro pulses.

Use of the tester with known good units will help in becoming thoroughly familiar with the features and trouble shooting capabilities it has.

5.4 KTS 152 TEST PROCEDURE

5.4.1 Panel Switch Positions

Input Power:		
14/28 VDC	_____	OFF
115 VAC	_____	OFF
Unit Power:		
115 VAC	_____	OFF
14/28 VDC	_____	OFF
26 VAC	_____	OFF
+14V___+28V	_____	+14V
HDG Transmitter	_____	CX-1
Flux Valve Sim		
X	_____	ON
Y	_____	OFF
Z	_____	OFF
Gyro-Gyro Sim	_____	Gyro
Gyro Simulator		
ON-OFF	_____	OFF
CCW-CW	_____	CW
VAR-30 deg./s	_____	VAR
Free Run- 1 Rev	_____	Free Run
KA 51A		
Slave/In	OFF	

5.4.2 Input Power Switches

14/28 VDC	_____	ON
115 VAC	_____	ON
14/28 VDC Input Power Lamp	_____	ON
115 VAC Input Power Lamp	_____	ON
KG 102/A AP Valid Lamp	_____	ON
One of four 1 deg. lamps	_____	ON
Voltage Monitor		
26VAC	_____	26 +/- 2 VAC
Frequency	_____	400 +/- 20 Hz
+14 VDC	_____	+14 +/- 1 VDC
+28 VDC	_____	+28 +/- 2 VDC
+12 VDC	_____	+12 +/- 1.2VDC
-12 VDC	_____	-12 +/- 1.2 VDC
+5 VDC	_____	+5 +/- 0.5 VDC

KGS 105 Pins X to r	_____	0.00 +/- 1 VAC
KGS 105 Pin c to Gnd	_____	0.00 +/- 1 VAC

5.4.3 UNIT POWER

115 VAC	_____	ON
14/28 VDC	_____	ON
26 VAC	_____	ON
KGS 105 - 115 VAC Lamp	_____	OFF
KG 102/A - 14/28 VDC Lamp	_____	OFF
KSG 105 - Pins X to r	_____	0.00 +/- 2 VAC
KSG 105 - Pins c to Gnd	_____	0.00 +/- 2 VAC
KG 102/A - Pin e-to Gnd	_____	0.00 +/- VDC

5.4.4

GROUND KG 102/A Pin b	_____	Improper Connection Lamp ON

5.4.5

GROUND KG 102/A PIN V	_____	KG 102/A Lamp ON
	_____	Improper Connection Lamp OFF
KG 102A pin e to Gnd	_____	14 +/- 1 VDC
KSG 105 Lamp	_____	ON
KSG 105 Pins X to r	_____	115 +/- 10 VAC
KSG 105 Pin c to Gnd	_____	26 +/- 2 VAC
Remove ground at pins b and V		
INPUT POWER Switch 14/28 VDC	_____	OFF
UNIT POWER Switch 14/28 VDC	_____	OFF

5.4.6

Ground KSG 105 Pin b	_____	Improper Connection Lamp ON

5.4.7

Ground KSG 105 Pin a	_____	KSG 105 Lamp ON
	_____	Improper Connection Lamp OFF
KSG 105 Pins X to r	_____	115 +/- 10 VAC
KSG 105 Pin c to G-nd	_____	26 +/- 2 VAC
GS 102/A Lamp-	_____	OFF

UNIT Power - 115 VAC Switch _____ OFF

- 26 VAC Switch _____ OFF

Remove KSG 105 grounds at pins b and a

5.4.8 KG 102/A Short Circuit Test

CAUTION:

This test can result in tester damage if not performed in the following manner.

a) INPUT POWER SWITCH 14/28 VDC _____ ON

b) UNIT POWER SWITCH 14/28 VDC _____ OFF

c) Ground KG 102/A pins b and V

d) Connect a 2.0 ohm 10W resistor between KG 102/A Pin e and ground. This resistor can vary by 20% and represents a short circuit to the 14V supply.

CAUTION:

Switch the KG 102/A Unit Power 14/28 VDC switch ON for no more than ONE SECOND if the IMPROPER CONNECTION Lamp does NOT come ON. This lamp should light within one-quarter to one-half of a second after the switch has been operated. The KG 102/A 14/28 VDC lamp shall go OFF.

e) If the lamp does light, leave the 14/28VDC switch ON. (An internal relay has removed power to the 2.0 ohm short circuit.)

f) Remove the 2.0 ohm resistor from pin e.

Improper Connection Lamp _____ ON

KG 102/A Pin e to Gnd _____ 0.0 +/- 0.1 VDC

g) Switch the 14/28 VDC unit power switch OFF, then ON.

KG 102/A 14/28 VDC Lamp _____ ON

Improper Connection Lamp _____ OFF

KG 102/A pin e to Gnd _____ 14 +/- 2VDC

5.4.9 Ground KG 102/A

Pin a _____ HDG Valid ON

Pin d _____ AP Valid OFF

Remove Grounds from pins a and d

5.4.10 Jumper KSG 105

Pin V to n _____ HDG Valid ON

Pin V to m _____ HDG Invalid ON

Pin j to U _____ AP Valid ON

Pin j to Y _____ Invalid ON

Remove Jumpers

5.4.11

Remove ground from KG 102/A pin V and ground KSG 105 pin a. Connect the circuit shown below to the tester pin jacks.

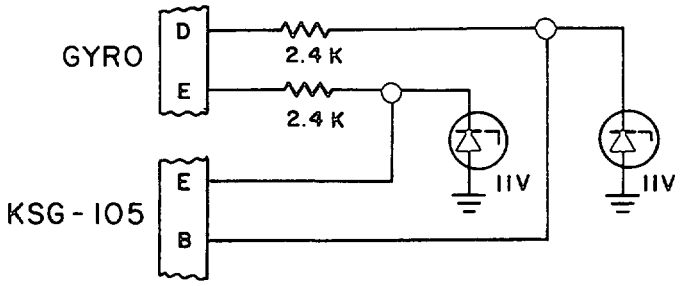


FIGURE 5-1, GYRO TO KSG 105 CONNECTIONS

Panel switches:

Gyro	_____	Gyro Sim
Gyro Simulator	_____	ON
	_____	CCW
	_____	30 deg/s
	_____	FREE RUN
R121 Trim Pot	_____	Adjust for a square wave period of 33.3 ms at GYRO pin D.

Monitor the Waveform Analysis CAL.TP. with a scope and adjust R160 (inside the tester) for 5 ms positive pulses.

5.4.12

Monitor the waveforms at GYRO pins D and E. They shall appear as shown below:

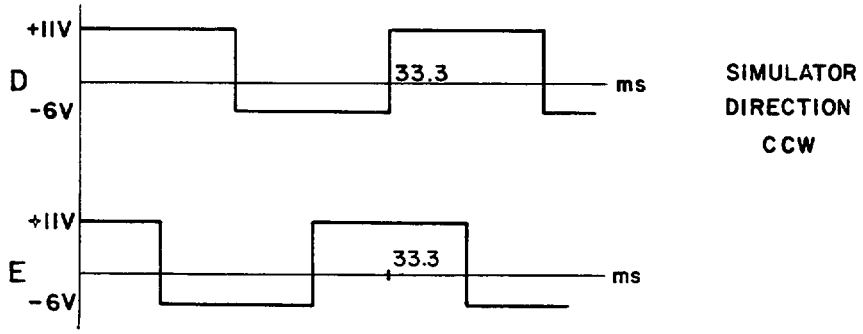


FIGURE 5-2, GYRO WAVEFORMS

5.4.13

GYRO SIMULATOR VAR/30 deg/s	_____	VAR
RATE Adjust	_____	Fully CW
Period - Gyro Pin E	_____	15 +/- 10 ms
RATE Adjust	_____	Fully CCW
Period - GYRO Pin E	_____	1 sec Min.

5.4.14

Adjust the Pin E period for 18 ms and depress the WAVEFORM ANALYSIS FAIL-RESET button.

FAIL LAMP _____ ON

Adjust the period for 25ms and depress the RESET BUTTON.

FAIL LAMP _____ OFF

(This lamp should come on when the period is reduced to 20ms)

5.4.15

Adjust the period for 1 sec. and the simulator direction to CCW.

1 deg LED's:

Rotation	_____	CCW
Step period	_____	0.25 +/- 0.05 sec

Simulator direction CW

Rotation	_____	CW
Step period	_____	0.25 +/- 0.05 Sec

5.4.16 Panel Switches:

VAR -- 30 deg/S	_____	30 deg/s
FREE Run - 1 Rev	_____	1 Rev

Set the scope sweep to 2 sec/cm and monitor GYRO pin D. Wait 15 seconds; there shall be no square wave on pin D or E. Depress the ONE REV --- RESET button and measure the time during which the square wave is present.

Square Wave Duration _____ 12 +/- 0.5 sec

Every time the reset button is depressed, 360 cycles of the pin D square wave should occur and then stop.

5.4.17

Depress the reset button and then switch simulator ON/OFF switch OFF. The waveform shall stop. Remove the circuit shown in step 11 above.

5.4.18 Slave Synchro Calibration

INPUT POWER 14/28VDC	_____	OFF
26VAC Switch	_____	ON
14v -- 28V Switch	_____	28V

Remove GND from KSG-105 pin a and GND KG-102 pin V. Connect 26VAC from KSG 105 pin c through 3.9K ohms to KG 102/A pin Z as shown below:

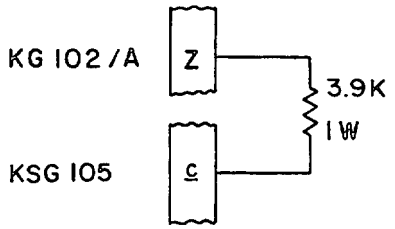


FIGURE 5-3, KG 102/A TO KSG 105 CONNECTIONS

Place the slave switch X ON and Y and Z OFF. Ground KG 102/A pin W and monitor v with a scope. Loosen the slave CT hold down screws and rotate for zero volts AC on the scope (slave CT is synchro directly behind compass card with N on the compass card under the lubber line. Tighten the hold down screws.

To determine if this is the correct null, connect a second scope probe to KSG 105 pin P. With the compass card remaining on "N", switch X OFF and Y ON.

The two waveforms shall appear as follows:

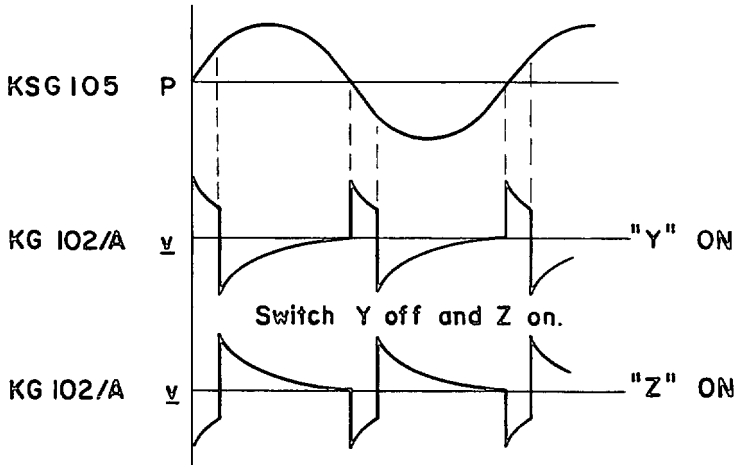


FIGURE 5-4, SLAVE SYNCHRO CALIBRATION WAVEFORMS

If the "Y" and "Z" waveforms are reversed, the slave CT must be rotated 180 degrees.

5.4.19 Heading Transmitter Calibration

INPUT POWER 14/28V	_____	ON
KSG 105 Pin a	_____	GND
KSG 105 Pin T	_____	GND
CX-1 ------ CX-2	_____	CX-1
KG 102/A Pin e	_____	28 +/- 2VDC

Connect 26 VAC from KSG 105 Pin c through 3.9K ohms to KSG 105 pin Z.

Loosen the HDG CT hold down screws and rotate the synchro until N is under the lubber line. (HDG CT is the unit next to the stepper motor). The card should step back and forth about "N" approximately every second. Tighten the hold down screws.

5.4.20

Remove the 26 VAC from pin Z and connect it to pin W. The heading card shall move rapidly CW to approximately 305 degrees where it slows rapidly to a stepping motion until it reaches 300 degrees. The card should then step back and forth about 300 +/- 2 deg. Remove KSG-105 grounds at pins a and T. Remove 26 VAC from pin W.

5.4.21

KSG 105 Flux Valve Simulation

Flux Valve Switches	X	_____	ON
	Y	_____	OFF
	Z	_____	OFF
KSG 105 Pin	L	_____	0.06 +/- 0.01 VDC
	H	_____	0.00 +/- 0.01 VDC
	D	_____	0.00 +/- 0.01 VDC
Flux Valve Switches	X	_____	OFF
	Y	_____	ON
	Z	_____	OFF
KSG 105 Pins	L	_____	0.00 +/- 0.01 VDC
	H	_____	0.06 +/- 0.01 VDC
	D	_____	0.00 +/- 0.01 VDC
Flux Valve Switches	X	_____	OFF
	Y	_____	OFF
	Z	_____	ON
KSG 105 Pins	L	_____	0.00 +/- 0.01 VDC
	H	_____	0.00 +/- 0.01 VDC
	D	_____	0.06 +/- 0.01 VDC
Flux Valve Switches	X	_____	OFF
	Y	_____	OFF
	Z	_____	OFF
KSG 105 Pin u		_____	GND

KSG 105 Pins	L	_____	0.06 +/- 0.01 VDC
	H	_____	0.06 +/- 0.01 VDC
	D	_____	0.06 +/- 0.01 VDC
UNIT AND INPUT POWER		_____	OFF

ILLUSTRATED PARTS LIST

6.1 General

The Illustrated Parts List (IPL) is a complete list of assemblies and parts required for the unit. The IPL also provides for the proper identification of replacement parts. Individual parts lists within this IPL are arranged in numerical sequence starting with the top assembly and continuing with the sub-assemblies. All mechanical parts will be separated from the electrical parts used on the sub-assembly. Each parts list is followed by a component location drawing.

Parts identified in this IPL by Honeywell part number meet design specifications for this equipment and are the recommended replacement parts. Warranty information concerning Honeywell replacement parts is contained in Service Memo #1, P/N 600-08001-00XX.

Some part numbers may not be currently available. Consult the current Honeywell catalog or contact a Honeywell representative for equipment availability.

6.2 Revision Service

The manual will be revised as necessary to reflect current information.

6.3 List of Abbreviations

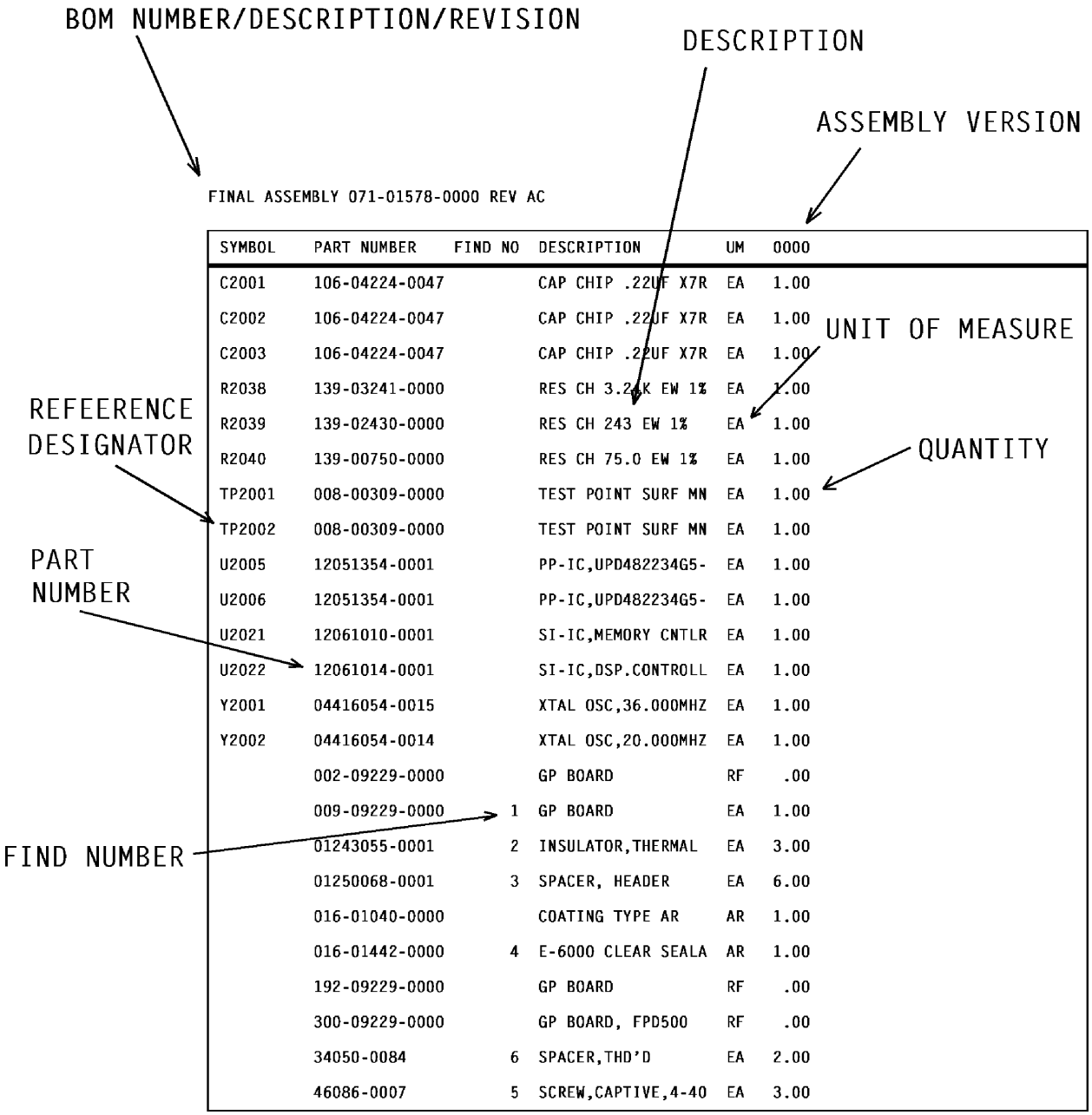
Abbreviation	Name
B	Motor or Synchro
C	Capacitor
CJ	Circuit Jumper
CR	Diode
DS	Lamp
E	Voltage or Signal Connect Point
F	Fuse
FL	Filter
FT	Feedthru
I	Integrated Circuit
J	Jack or Fixed Connector
L	Inductor
M	Meter
P	Plug

Table 1
Abbreviations

Abbreviation	Name
Q	Transistor
R	Resistor
RT	Thermistor
S	Switch
T	Transformer
TP	Test Point
U	Component Network, Integrated Circuit, Circuit Assembly
V	Photocell/Vacuum Tube
W	Waveguide
Y	Crystal

Table 1 (Continued)
Abbreviations

6.4 Sample Parts List



FINAL ASSEMBLY 071-01578-0000 REV AC

SYMBOL	PART NUMBER	FIND NO	DESCRIPTION	UM	0000
C2001	106-04224-0047		CAP CHIP .22UF X7R	EA	1.00
C2002	106-04224-0047		CAP CHIP .22UF X7R	EA	1.00
C2003	106-04224-0047		CAP CHIP .22UF X7R	EA	1.00
R2038	139-03241-0000		RES CH 3.24K EW 1%	EA	1.00
R2039	139-02430-0000		RES CH 243 EW 1%	EA	1.00
R2040	139-00750-0000		RES CH 75.0 EW 1%	EA	1.00
TP2001	008-00309-0000		TEST POINT SURF MN	EA	1.00
TP2002	008-00309-0000		TEST POINT SURF MN	EA	1.00
U2005	12051354-0001		PP-IC,UPD482234G5-	EA	1.00
U2006	12051354-0001		PP-IC,UPD482234G5-	EA	1.00
U2021	12061010-0001		SI-IC,MEMORY CNTLR	EA	1.00
U2022	12061014-0001		SI-IC,DSP.CONTROLL	EA	1.00
Y2001	04416054-0015		XTAL OSC,36.000MHZ	EA	1.00
Y2002	04416054-0014		XTAL OSC,20.000MHZ	EA	1.00
	002-09229-0000		GP BOARD	RF	.00
	009-09229-0000	1	GP BOARD	EA	1.00
	01243055-0001	2	INSULATOR,THERMAL	EA	3.00
	01250068-0001	3	SPACER, HEADER	EA	6.00
	016-01040-0000		COATING TYPE AR	AR	1.00
	016-01442-0000	4	E-6000 CLEAR SEALA	AR	1.00
	192-09229-0000		GP BOARD	RF	.00
	300-09229-0000		GP BOARD, FPD500	RF	.00
	34050-0084	6	SPACER,THD'D	EA	2.00
	46086-0007	5	SCREW,CAPTIVE,4-40	EA	3.00

The above is only a sample. The actual format and style may vary slightly. A 'Find Number' column, when shown, references selected items on the BOM's accompanying Assembly Drawing. This information does not apply to every BOM. Therefore, a lack of information in this column, or a lack of this column, should not be interpreted as an omission.

Figure 6-1
Sample Parts List

THIS PAGE IS RESERVED

6.5 KTS 152 FINAL ASSEMBLY/SUB-ASSEMBLIES

071-05026-0000 Rev. 5

SYMBOL	PART NUMBER	FIND NO	DESCRIPTION	UM	0000
	071-01053-0000		SLAVING ACCESSORY	EA	1.00
	076-00900-0002		DIAL HEADING	EA	1.00
	155-02109-0000			EA	.00
	155-02110-0000			EA	.00
	200-01866-0000		HEADING DRIVE ASSY	EA	1.00

071-01053-0000 Rev. 4
071-01053-0099 Rev. 1

SYMBOL	PART NUMBER	FIND NO	DESCRIPTION	UM	0000	0099
	012-01088-0000		CUSHION	EA	.	1.00
	023-00096-0001		MTR SLAVE	EA	1.00	.
	025-00018-0000		WIRE 26 BLK	IN	.	3.60
	025-00018-0022		WIRE 26 RED	IN	.	3.60
	057-01520-0001		SERIAL NUMBER TAG	EA	1.00	.
	071-01053-0099		COMMON BOM	EA	1.00	.
	088-00393-0001		PLATE FACE	EA	1.00	.
	088-00404-0000		COVER	EA	1.00	.
	088-00406-0001		PSHBTN W/MARKING	EA	.	1.00
	088-00406-0002		PSHBTN W/MARKING	EA	1.00	.
	088-00406-0003		PSHBTN W/MARKING	EA	.	1.00
	089-06414-0004		SCR PHP 2-28X1/4	EA	.	2.00
	200-00690-0000		COMPENSATOR PC BD	EA	1.00	.

200-00690-0000 Rev. 3

SYMBOL	PART NUMBER	FIND NO	DESCRIPTION	UM	0000
	007-06029-0000		DIO S 1N457A	EA	4.00
	009-05366-0000		PC BD	EA	1.00
	016-01026-0000		RTV CLEAR DC #732	AR	.00
	019-05069-0000		XFMR	EA	1.00
	031-00226-0000		SW MOM DPDT	EA	2.00
	031-00226-0002		SW MOM DPDT	EA	1.00
	096-01030-0030		CAP TN 22UF10%35V	EA	1.00
	130-00103-0023		RES FC 10K QW 5%	EA	1.00
	130-00512-0023		RES FC 5.1K QW 5%	EA	1.00
	133-00045-0005		RES VA 10K QW 30%	EA	2.00
	136-01002-0072		RES PF 10K QW 1%	EA	2.00
	150-00004-0010		TUBING TFLN 22AWG	IN	1.20

200-01866-0000 Rev. 0

SYMBOL	PART NUMBER	FIND NO	DESCRIPTION	UM	0000
	016-01008-0004		GLYPTAL 7526 BL	AR	.00
	016-01029-0000		EPOXY HY-SOL 1C	AR	.00
	029-00254-0000		GEAR CHG 12/36T	EA	1.00
	029-00266-0000		GEAR PIN 12T/64DP	EA	1.00
	029-00305-0001		GEAR 18/36T	EA	1.00
	029-00306-0000		GEAR SPUR 64P	EA	2.00
	029-00306-0001		GEAR SPUR 64P	EA	2.00
	047-03669-0002		GEAR PLT W/HDW	EA	1.00
	073-00034-0001		MOUNTING LUG	EA	4.00
	078-00023-0000		SPRING RETURN	EA	2.00
	089-05853-0004		SCR SET 2-56X1/8	EA	4.00
	089-05903-0003		SCR PHP 4-40X3/16	EA	2.00
	089-06024-0004		SCR SHC 4-40X1/4	EA	4.00
	090-00019-0002		RING RTNR .250	EA	2.00
	090-00186-0000		RETAINER RING	EA	2.00
	148-00007-0000		SYNCHRO XMTR	EA	1.00
	148-00013-0000		SYNCHRO CONT XFMR	EA	1.00
	148-05027-0001		MOT STPG 12VDC	EA	1.00

071-05026-0000 Rev. 1 (Original Manual Revision)

NAME	ASS'Y. NO.
KTS 152 KSG 105 - KG 102/A Tester	

KING RADIO CORP. PARTS LISTING			CODE	QUANTITY				
SYMBOL	PART NUMBER	DESCRIPTION		-00	-01	-02	-03	-04
R101		Res 750 ohm 1W 5%		7				
R102		Res 51K 5%		27				
R103		Res 5.1K 5%		2				
R104		Res 5.1K 5%		-				
R105		Res 1.5K 1W 5%		1				
R106		Res 0.27 ohm 5W 5%		1				
R107		Res 20K 5%		1				
R108		Res 240 ohm ½W 5%		5				
R109		Res 240 ohm ½W 5%		-				
R110		Res 240 ohm ½W 5%		-				
R111		Res 100K 5%		1				
R112		Res 10K 5%		12				
R113		Res 200 ohm 5W 5%		2				
R114		Res 200 ohm 5W 5%		-				
R115		Res 62K 5%		2				
R116		Res 62K 5%		-				
R117		Res 750 ohm 1W 5%		-				
R118		Res 51K 5%		-				
R119		Res 10 ohm 1W 5%		1				
R120		Res Var 1 Turn 750K Pot		1				
R121		Res Var 10 Turn 10K Trimmer		1				
R122		Res 1.0K 5%		4				
R123		Res 510 ohm 5%		2				
R124		Res 51K 5%		-				
R125		Res 51K 5%		-				
R126		Res 51K 5%		-				
R127		Res 51K 5%		-				
R128		Res 51K 5%		-				
R129		Res 2.2K 5%		3				
R130		Res 2.2K 5%		-				
R131		Res 1.0 ohm 10W 5%		1				
R132		Res 75 ohm 10W 10%		1				
R133		Res 10K 5%		-				
R134		Res 10K 5%		-				
R135		Res 10K 5%		-				
R136		Res 10K 5%		-				
R137		Res 51K 5%		-				
R138		Res 51K 5%		-				
R139		Res 10K 5%		-				
R140		Res 51K 5%		-				
R141		Res 1.0M ohm 5%		3				
R142		Res 680 ohm 5%		1				
R143		Res 510 ohm 5%		-				
R144		Res 2.2K 5%		-				
R145		Res 51K 5%		-				
R146		Res 51K 5%		-				
R147		Res 1.0M ohm 5%		-				
R148		Res 1.0K 5%		-				
R149		Res 51K 5%		-				
R150		Res 10K 5%		-				
R151		Res 39K 5%		1				
R152		Res 10K 5%		-				

NAME KTS 152 KSG 105 - KG 102/A Tester | ASS'Y. NO.

KING RADIO CORP. PARTS LISTING

SYMBOL	PART NUMBER	DESCRIPTION	CODE	QUANTITY -00	-01	-02	-03	-04
R153		Res 51K 5%		-				
R154		Res 2.0M ohm 5%		1				
R155		Res 2.2K 1W 5%		1				
R156		Res 750 ohm 1W 5%		-				
R157		Res 51K 5%		-				
R158		Res 51K 5%		-				
R159		Res 330K 5%		1				
R160		Res Var 500K 10 Turn Trimmer		1				
R161		Res 100 ohm 5%		1				
R162		Res 51K 5%		-				
R163		Res 51K 5%		-				
R164		Res 750 ohm 1W 5%		-				
R165		Res 750 ohm 1W 5%		-				
R166		Res 750 ohm 1W 5%		-				
R167		Res 750 ohm 1W 5%		-				
R168		Res 10K 5%		-				
R169		Res 10K 5%		-				
R170		Res 10K 5%		-				
R171		Res 10K 5%		-				
R172		Res 51K 5%		-				
R173		Res 51K 5%		-				
R174		Res 240 ohm ½W 5%		-				
R175		Res 240 ohm ½W 5%		-				
R176		Res 51K 5%		-				
R177		Res 51K 5%		-				
R178		Res 1.0K 5%		-				
R179		Res 51K 5%		-				
R180		Res 1.0K 5%		-				
R181		Res 1.0M ohm 5%		-				
R182		Res 51K 5%		-				
R183		Res 51K 5%		-				
R184		Res 51K 5%		-				
R185		Res 51K 5%		-				
R186		Res 10.0K 1%		6				
R187		Res 51.1 ohm 1%		6				
R188		Res 10.0K 1%		-				
R189		Res 51.1 ohm 1%		-				
R190		Res 10.0K 1%		-				
R191		Res 51.1 ohm 1%		-				
R192		Res 10.0K 1%		-				
R193		Res 51.1 ohm 1%		-				
R194		Res 10.0K 1%		-				
R195		Res 51.1 ohm 1%		-				
R196		Res 10.0K 1%		-				
R197		Res 51.1 ohm 1%		-				

NAME	ASS'Y. NO.
KTS 152 KSG 105 - KG 102/A Tester	

KING RADIO CORP. PARTS LISTING

SYMBOL	PART NUMBER	DESCRIPTION	CODE	QUANTITY -00	-01	-02	-03	-04
C101		Cap Elec 10uf 20V 10%		1				
C102		Cap My 0.1uf 50V		1				
C103		Cap My 0.15uf 200V		1				
C104		Cap Alum 100uf 50V		2				
C105		Cap Alum 100uf 50V		-				
C106		Cap Elec 0.1uf 35V		2				
C107		Cap Elec 0.1uf 35V		-				
C108		Cap Elec 2.2uf 20V		1				
C109		Cap Cern 0.01uf 80V		5				
C110		Cap Cerm 0.01uf 80V		-				
C111		Cap Elec 1.0uf 20V		2				
C112		Cap Cerm 0.01uf 80V		-				
C113		Cap Elec 1.0uf 20V		-				
C114		Cap My 0.08uf 50V		1				
C115		Cap My 0.4uf 50V		1				
C116		Cap Cerm 0.01uf 80V		-				
C117		Cap Cerm 0.01uf 80V		-				
C118		Cap Cerm 120pf 80V		2				
C119		Cap Cerm 120pf 80V		-				
CR101		LED Red		15				
CR102		Diode 1N457		24				
CR103		Diode 1N457		-				
CR104		Diode 1N457		-				
CR105		Diode 1N457		-				
CR106		LED Red		-				
CR107		Diode 1N457		-				
CR108		LED Red		-				
CR109		LED Red		-				
CR110		LED Red		-				
CR111		Diode 1N457		-				
CR112		Diode 1N457		-				
CR113		LED Red		-				
CR114		Diode 1N645		5				
CR115		Diode 1N645		-				
CR116		Diode 1N645		-				
CR117		Diode 1N645		-				
CR118		Diode 1N645		-				
CR119		Diode 1N457		-				
CR120		Diode 1N457		-				
CR121		Diode 1N457		-				
CR122		Diode 1N457		-				
CR123		Diode 1N457		-				
CR124		Diode 1N457		-				
CR125	VACTEC	VTL2C1		1				
CR126		Diode 1N457		-				
CR127		Diode 1N457		-				
CR128		Diode 1N457		-				
CR129		Diode 1N457		-				
CR130		Diode 1N457		-				
CR131		Diode Zen 15V 1N4744		1				
CR132		Diode 1N457		-				

NAME	ASS'Y. NO.
KTS 152 KSG 105 - KG 102/A Tester	

KING RADIO CORP. PARTS LISTING

SYMBOL	PART NUMBER	DESCRIPTION	CODE	QUANTITY -00	-01	-02	-03	-04
CR133		iode 1N457		-				
CR134		Diode 1N457		-				
CR135		Diode 1N457		-				
CR136		Diode 1N457		-				
CR137		Diode 1N457		-				
CR138		LED Red		-				
CR139		LED Red		-				
CR140		LED Red		-				
CR141		LED Red		-				
CR142		LED Red		-				
CR143		LED Red		-				
CR144		LED Red		-				
CR145		LED Red		-				
CR146		LED Red		-				
Q101		Tstr PNP 2N3906		1				
Q102		Darlington NPN MJE-800		1				
Q103		Darlington NPN SPS-6830		11				
Q104		Darlington NPN SPS-6830		-				
Q105		Darlington NPN SPS-6830		-				
Q106		Darlington NPN SPS-6830		-				
Q107		Darlington NPN SPS-6830		-				
Q108		Darlington NPN SPS-6830		-				
Q109		Tstr NPN 2N3416		1				
Q110		FET P-Channel 2N5463		2				
Q111		FET P-Channel 2N5463		-				
Q112		Darlington NPN SPS-6830		-				
Q113		Darlington NPN SPS-6830		-				
Q114		Darlington NPN SPS-6830		-				
Q115		Darlington NPN SPS-6830		-				
Q116		Darlington NPN SPS-6830		-				
I101		Regulator .5V 7805		1				
I102		Regulator +12V 7812		1				
I103		Regulator -12V 7912		1				
I104		Timer 555		2				
I105		Quad 2 Input NAND 4011		5				
I106		14 Bit Binary Cntr 4020		1				
I107		Dual 4 Input NAND 4012		1				
I108		Quad EXOR 4030		3				
I109		Dual D-FF 4013		3				
I110		Quad OP AMP LM324		2				
I111		Quad 2 Input NOR 4001		3				
I112		Dual D-FF 4013		-				
I113		Quad 2 Input NAND 4011		-				
I114		Hex Inverter 4049		1				
I115		Quad OP AMP LM324		-				
I116		Quad 2 Input NAND 4011		-				
I117		Quad 2 Input NOR 4001		-				
I118		Quad EXOR 4030		-				

NAME KTS 152 KSG 105 - KG 102/A Tester | ASS'Y. NO.

KING RADIO CORP. PARTS LISTING

SYMBOL	PART NUMBER	DESCRIPTION	CODE	QUANTITY -00	-01	-02	-03	-04
I119		Timer 555		-				
I120		Dual D-FF 4013		-				
I121		Quad EXOR 4030		-				
I122		Quad 2 Input NOR 4001		-				
I123		Quad 2 Input NAND 4011		-				
I124		Quad 2 Input NOR 4011		-				
K101A		Relay 26.5V DPDT3A		3				
K101B		Relay 26.5V DPDT3A		-				
K102		Relay 26.5V DPDT3A		-				
S101		Switch 10A DPDT		2				
S102		Switch 5A SPDT		3				
S103		Switch 5A SPST		8				
S104		Switch 10A DPDT		-				
S105		Switch 5A SPST		-				
S106		Switch 5A SPST		-				
S107		Switch 5A SPDT		-				
S108		Switch 5A SPDT		-				
S109		Switch 5A SPST		-				
S110		Switch Pushbutton N.O.		2				
S111		Switch 5A 4PDT		1				
S112		Switch Pushbutton N.C.		1				
S113		Switch 5A 3PDT		1				
S114		Switch 5A SPST		-				
S115		Switch 5A SPST		-				
S116		Switch 5A SPST		-				
S117		Switch Pushbutton N.O.		-				
S118		Switch 5A SPST		-				
F101		Fuse 5A		2				
F102		Fuse 3A		3				
F103		Fuse 5A		-				
F104		Fuse 3A		-				
F105		Fuse 3A		-				
L101		Lamp Neon 115VAC		2				
L102		Lamp Neon 115VAC		-				
J101	Bendix	Conn PTO-2A-22-555		2				
J102	Bendix	Conn PTS-2A-22-555		-				
J103	Bendix	Conn PTO-2A-14-125		1				

NAME KTS 152 KSG 105 - KG 102/A Tester | ASS'Y. NO.

KING RADIO CORP. PARTS LISTING

SYMBOL	PART NUMBER	DESCRIPTION	CODE	QUANTITY -00	-01	-02	-03	-04
P101	Bendix	Conn PTO-6A-22-55P		2				
P102	Bendix	Conn PTO-6A-22-55P		-				
P103	Bendix	Conn PTO-6A-14-12P		1				
	200-1866-00	Synchro-Motor Assy		1				
	076-0900-02	Compass Dial		1				
	071-1053-00	KA 51 Slaving Accessory		1				
		Banana Jacks		18				
		Pin Jacks 0.08 in		92				

PARTS LIST REVISION HISTORY				ENGR. APPROVAL
NAME KTS 152 KSG 105 - KG 102/A Tester				ASS'Y. NO. 071-5026-00
ASS'Y. DWG.			UNIT KTS 152	USED ON
REV	CHANGE	SYMBOL	PART NUMBER	DESCRIPTION
1	21273			B/M Retyped

THIS PAGE IS RESERVED

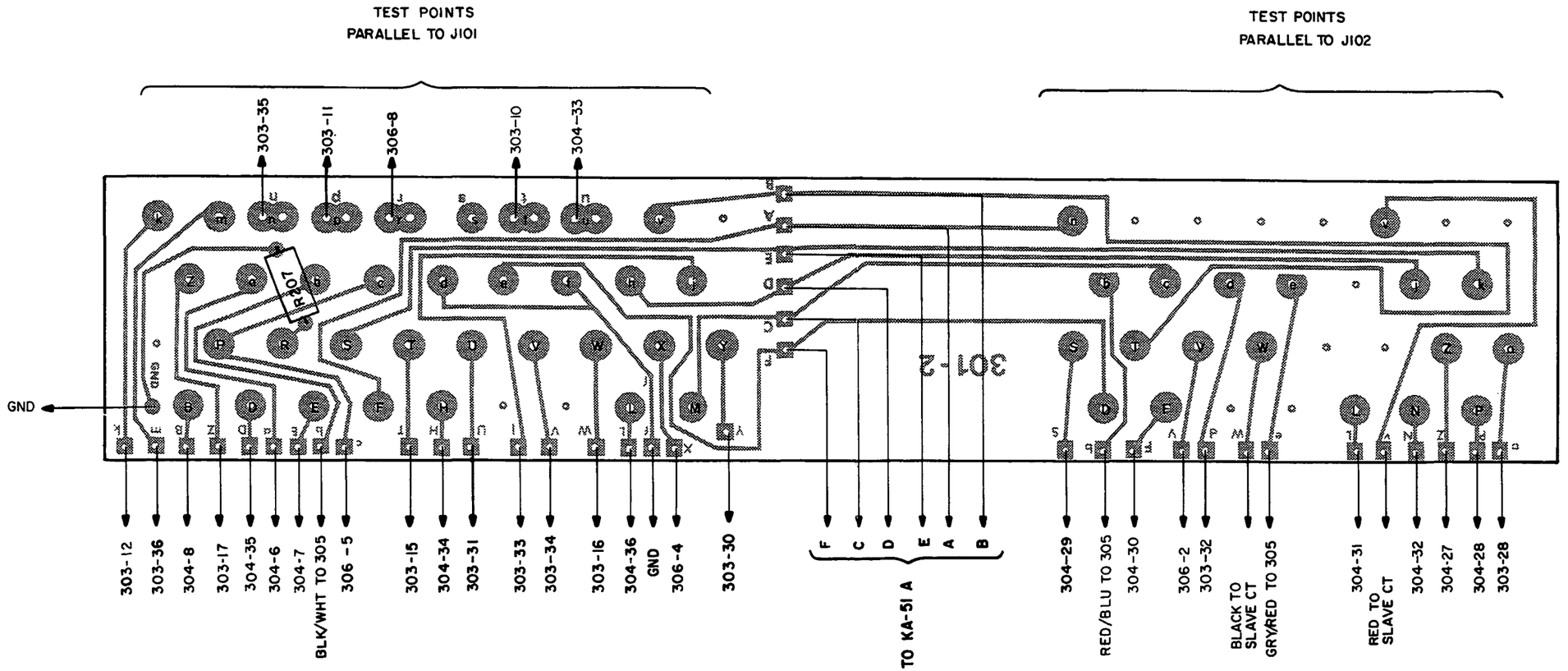


FIGURE 6-2 P.C. BOARD ASSEMBLY, BOARD 301-2, DRAWING
(Dwg. 300-05986-0000 Rev. 0)

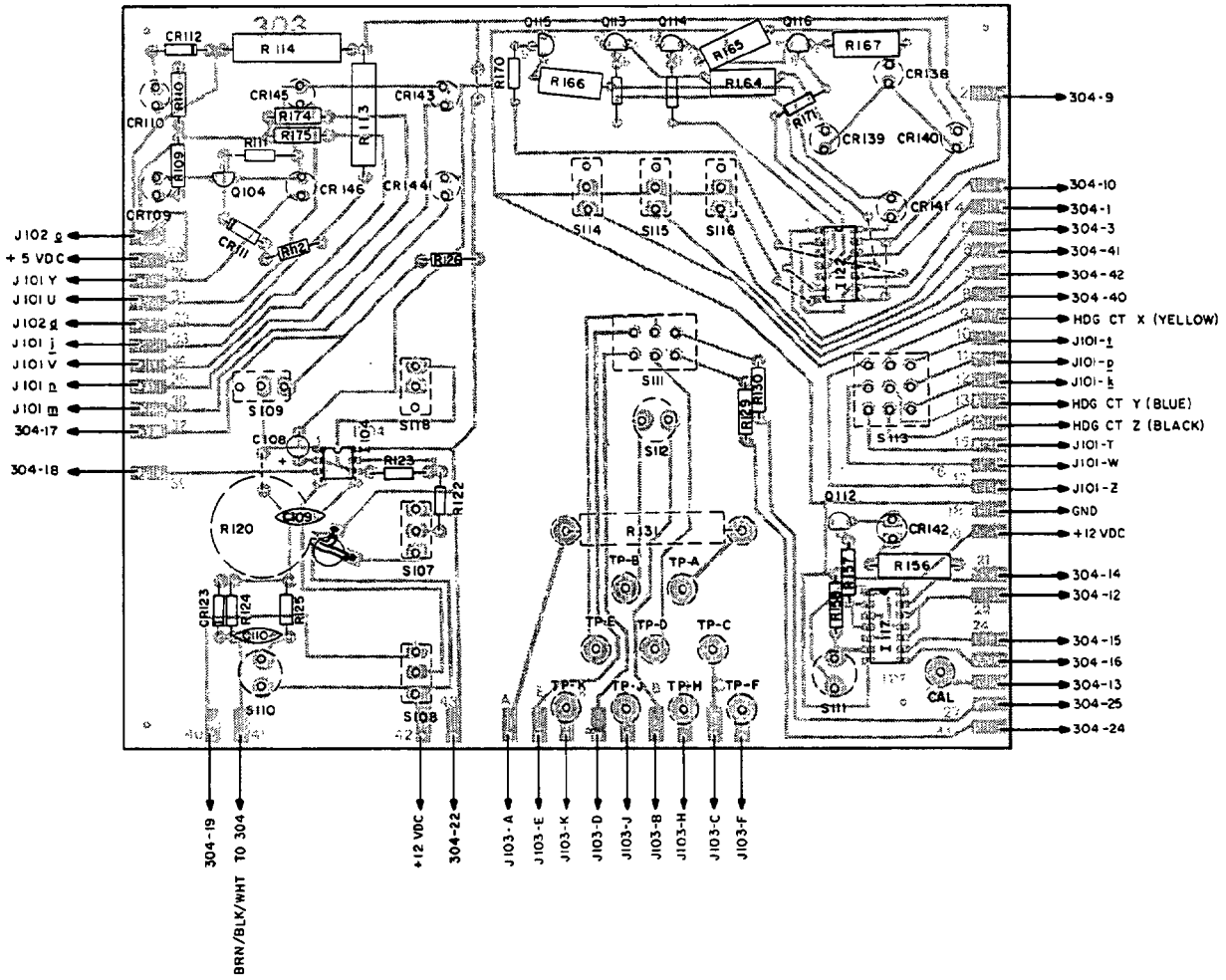


FIGURE 6-3 P.C. BOARD ASSEMBLY, BOARD 303, DRAWING
(Dwg. 300-05987-0000 Rev. 0)

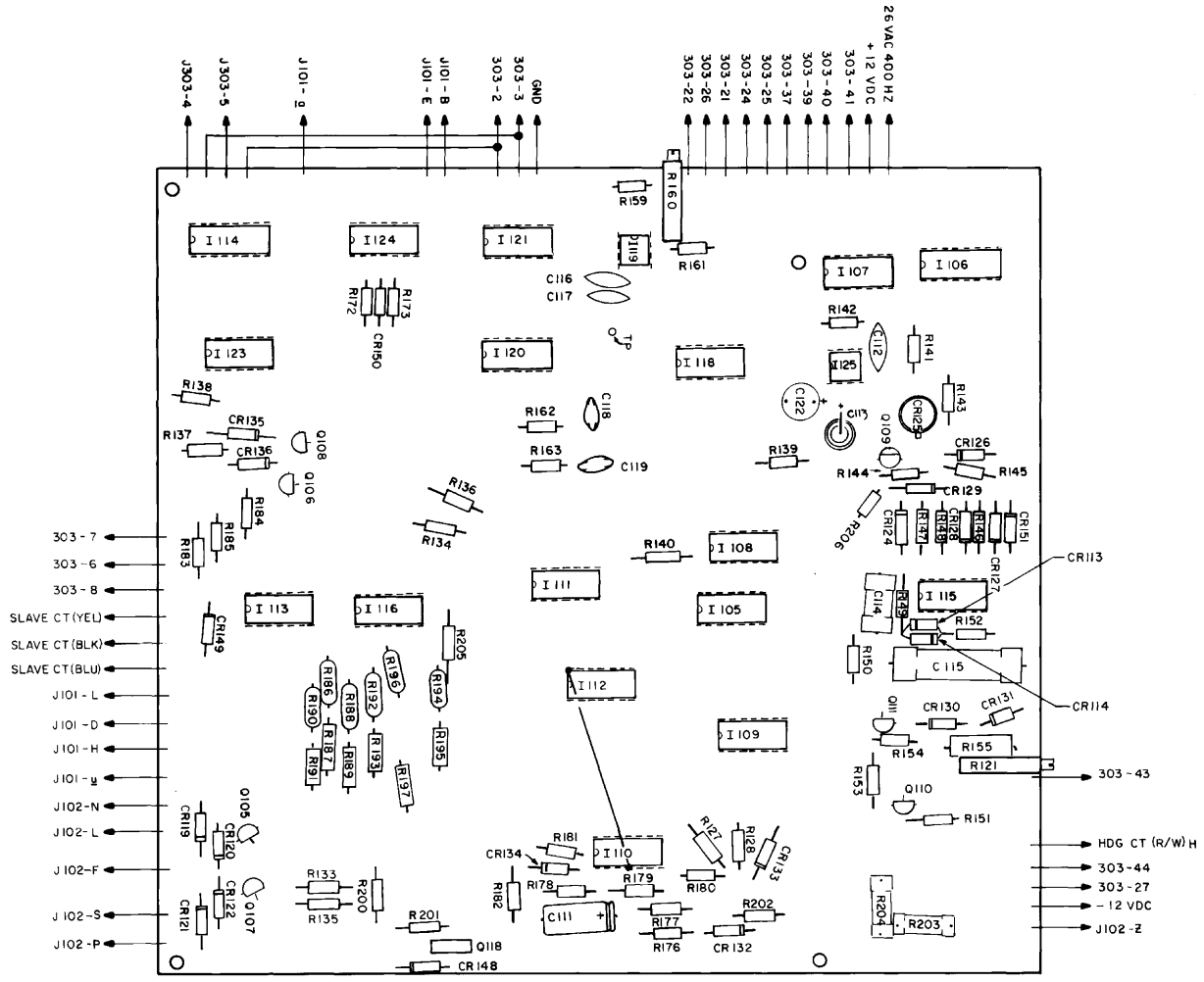


FIGURE 6-4 P.C. BOARD ASSEMBLY, BOARD 304, DRAWING
(Dwg. 300-05988-0000 Rev. 1)

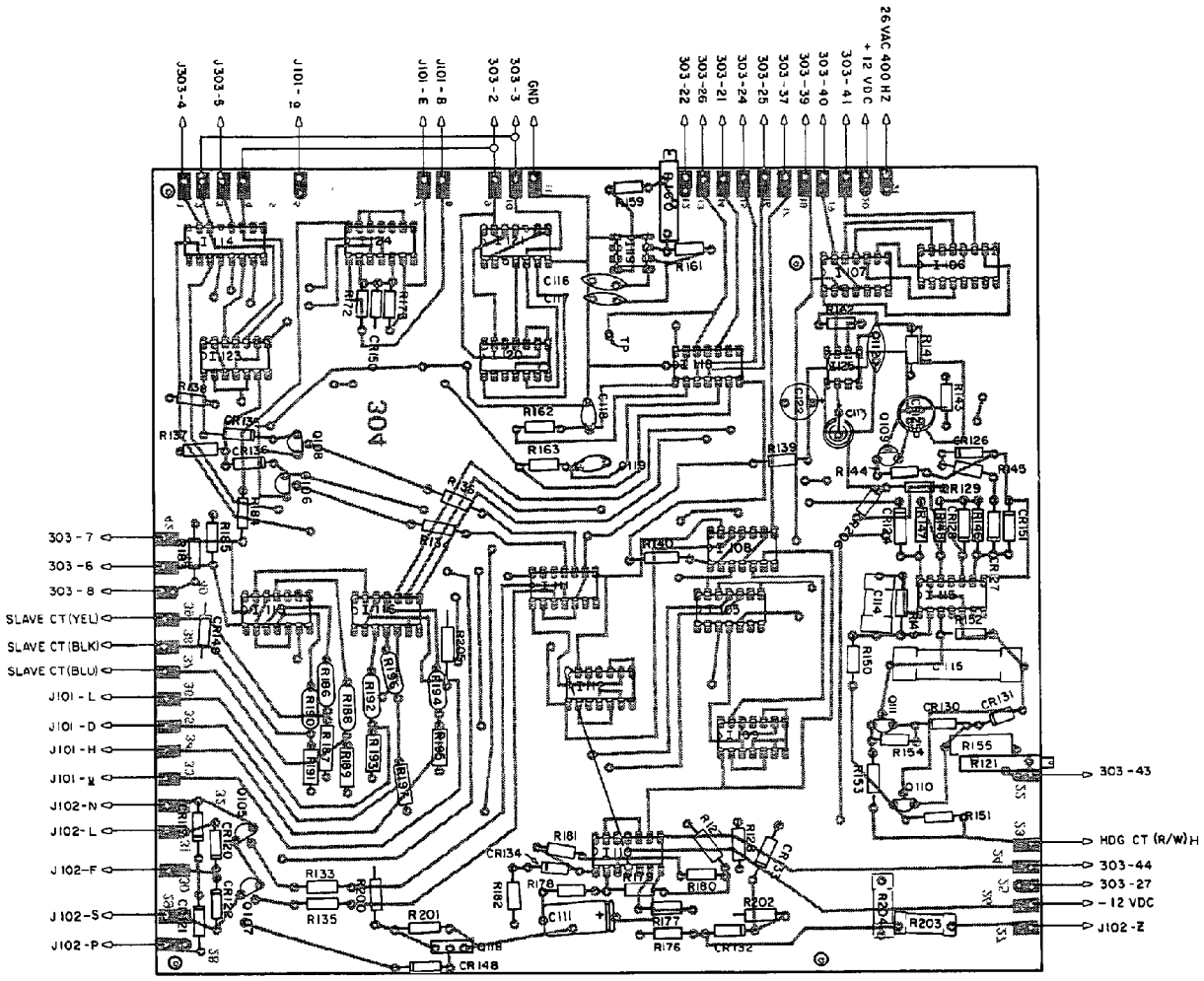


FIGURE 6-4A P.C. BOARD ASSEMBLY, BOARD 304, DRAWING
(Dwg. 300-05988-0000 Rev. 0)

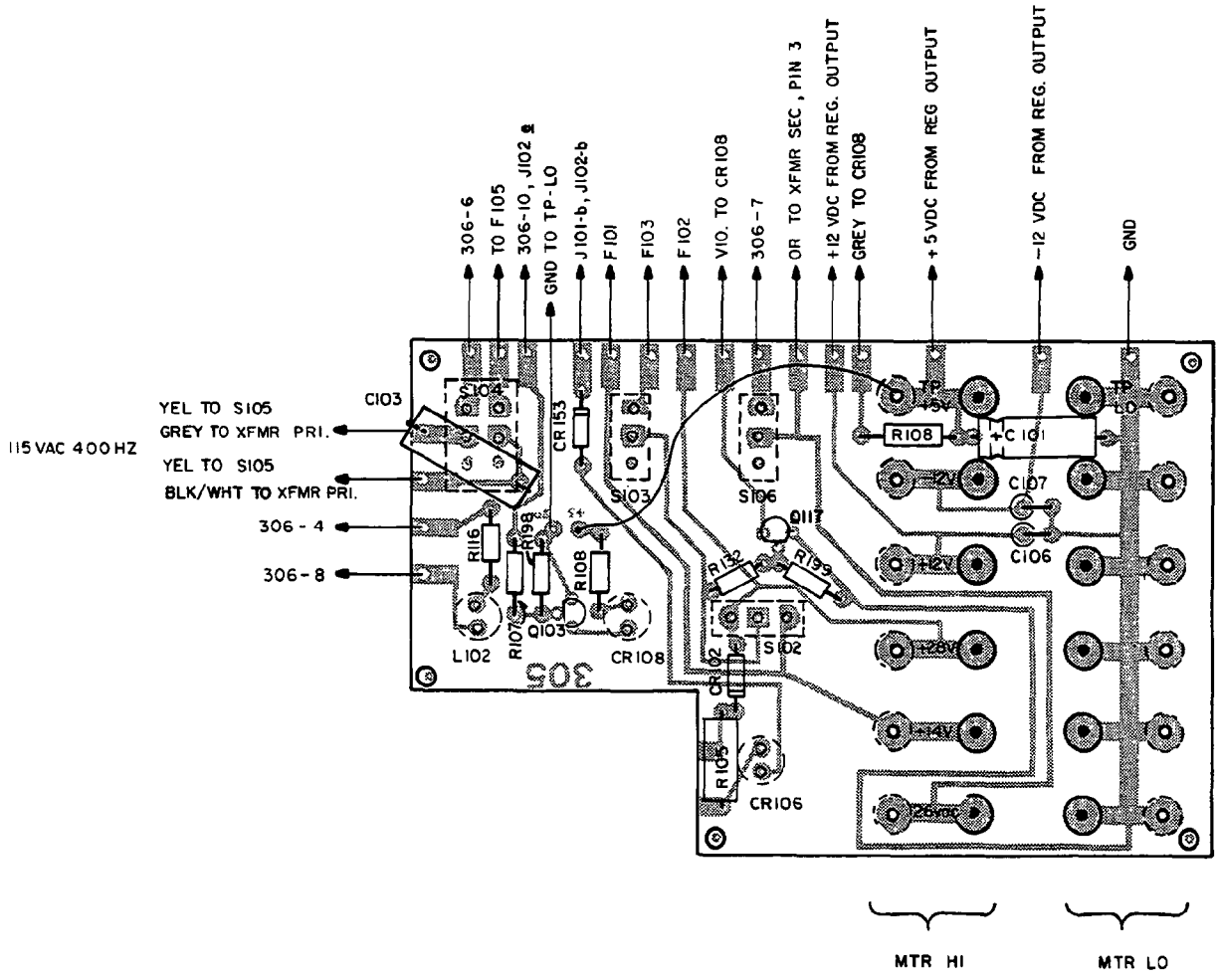


FIGURE 6-5 P.C. BOARD ASSEMBLY, BOARD 305, DRAWING
(Dwg. 300-05989-0000 Rev. 0)

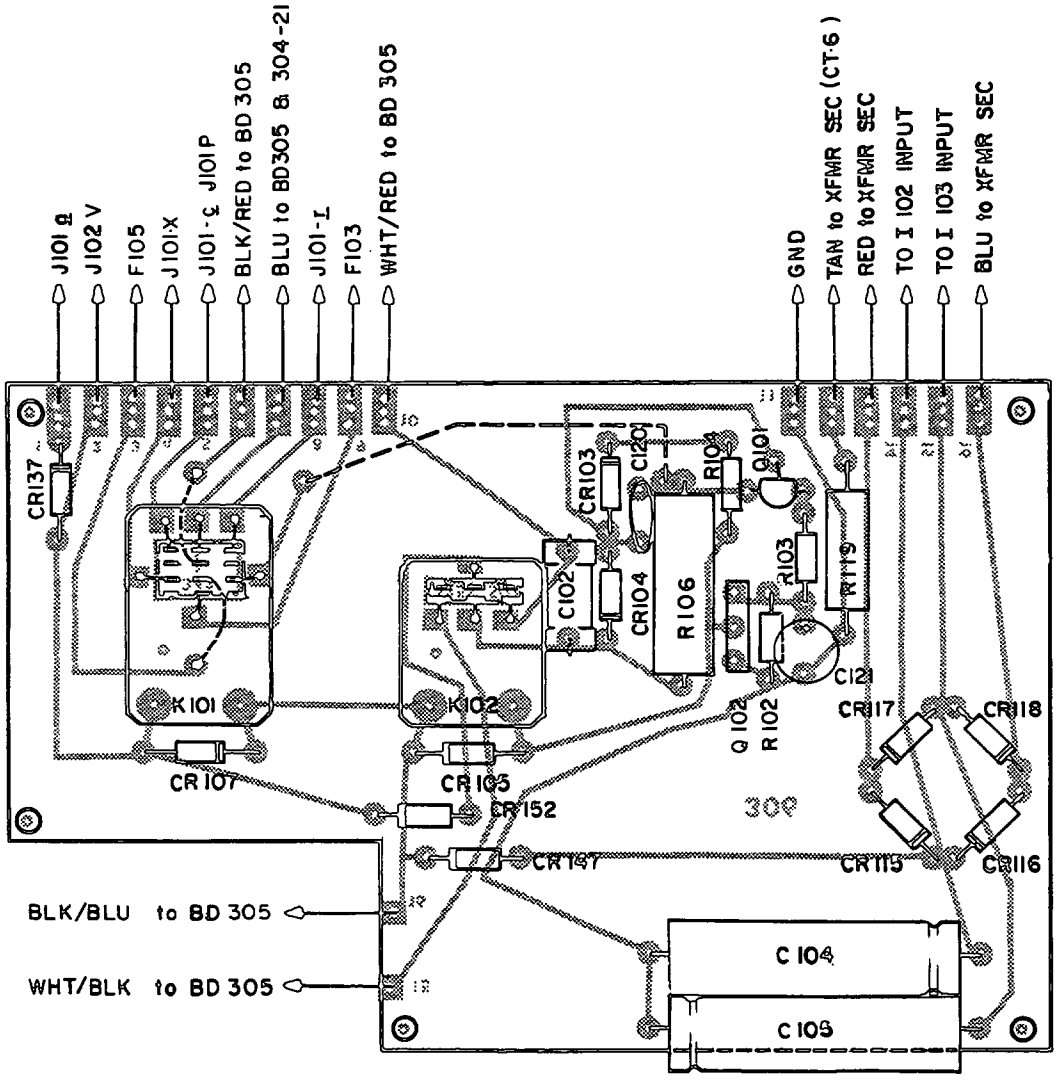


FIGURE 6-6 P.C. BOARD ASSEMBLY, BOARD 306, DRAWING
(Dwg. 300-05990-0000 Rev. 0)

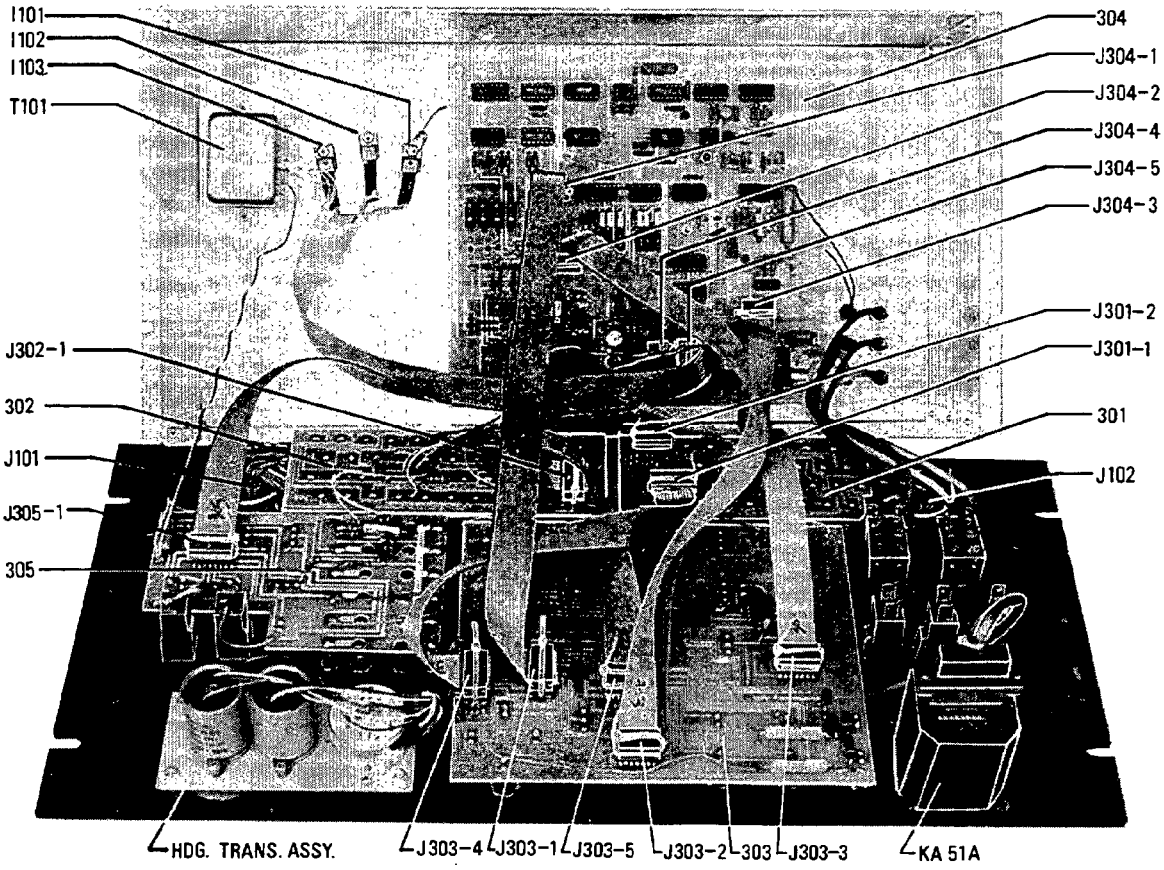


FIGURE 6-7 PARTIAL CABLE INTERCONNECT
KTS 152 S/N 1200 AND ABOVE

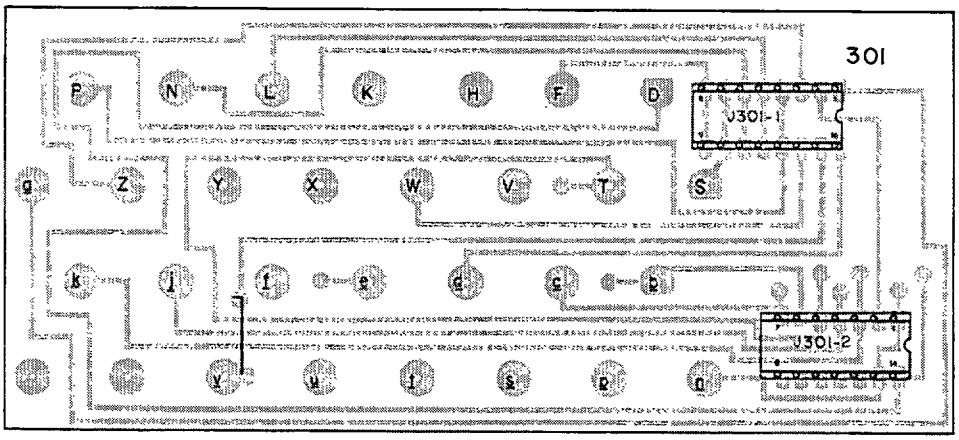


FIGURE 6-8 P.C. BOARD ASSEMBLY, BOARD 301, DRAWING

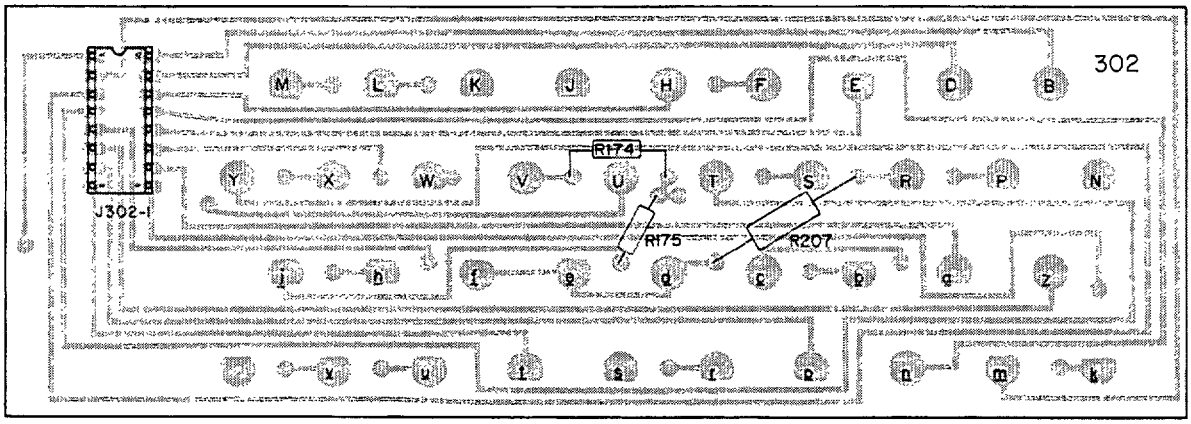


FIGURE 6-9 P.C. BOARD ASSEMBLY, BOARD 302, DRAWING

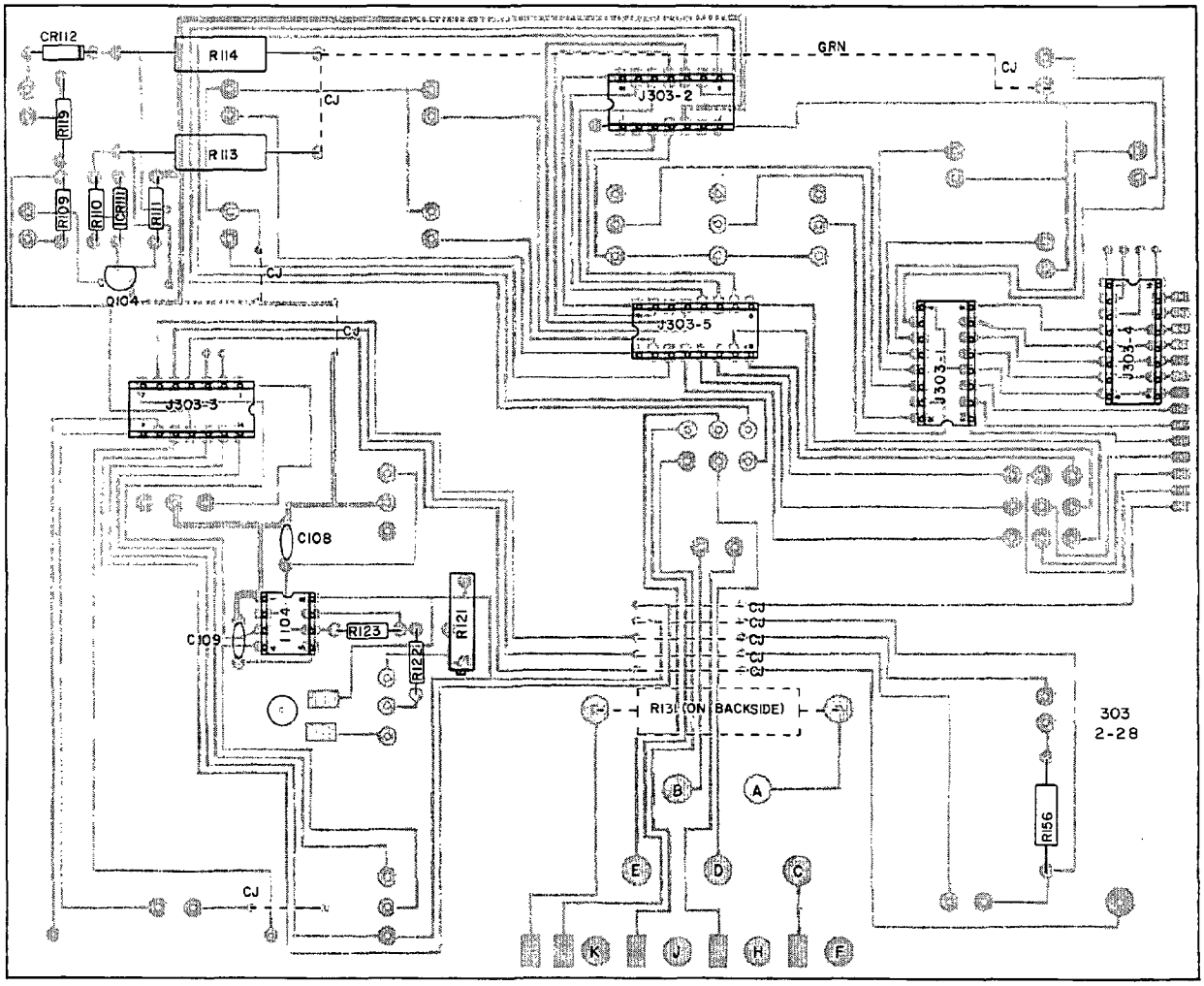


FIGURE 6-10 P.C. BOARD ASSEMBLY, BOARD 303, DRAWING

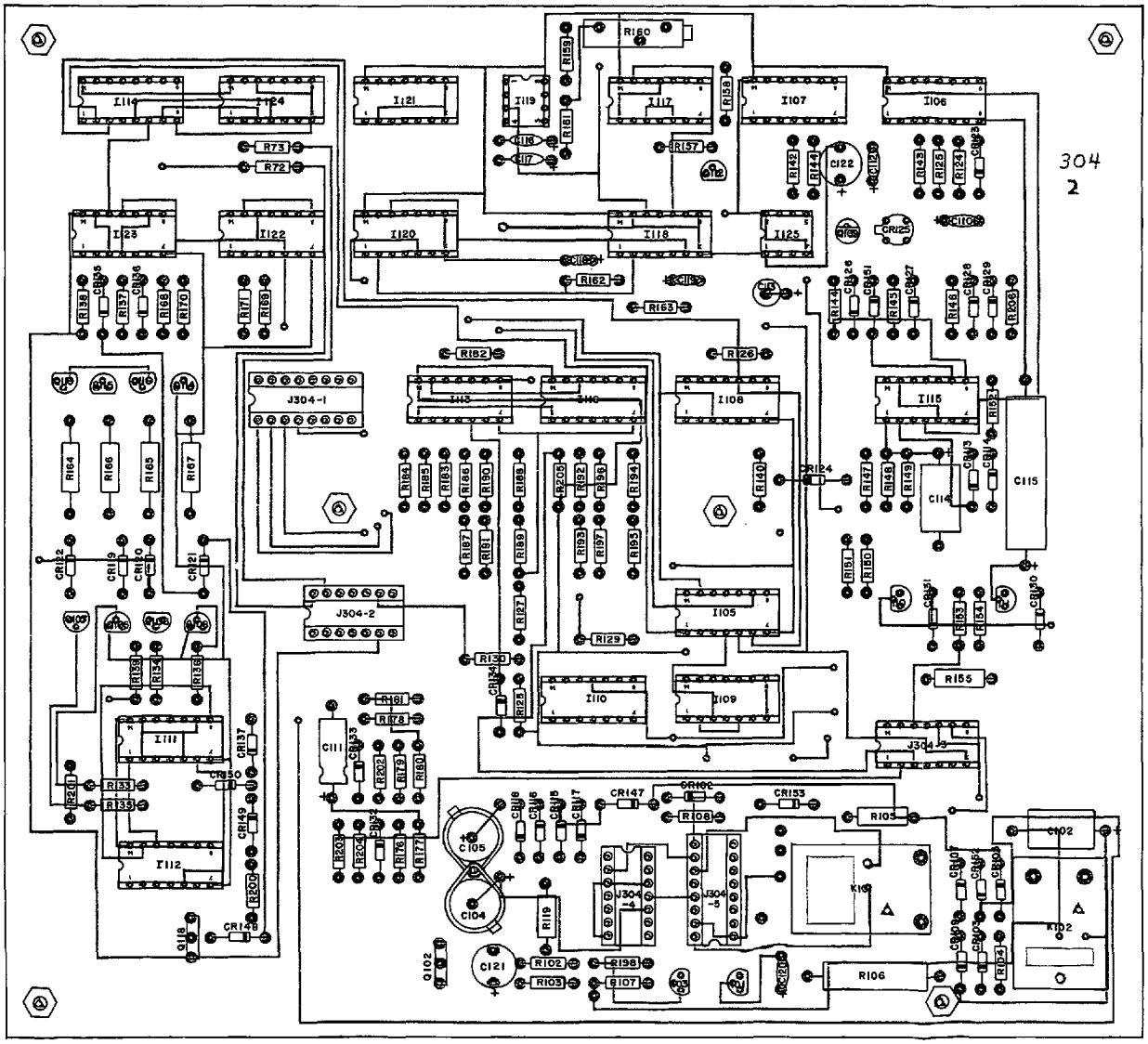


FIGURE 6-11 P.C. BOARD ASSEMBLY, BOARD 304, DRAWING

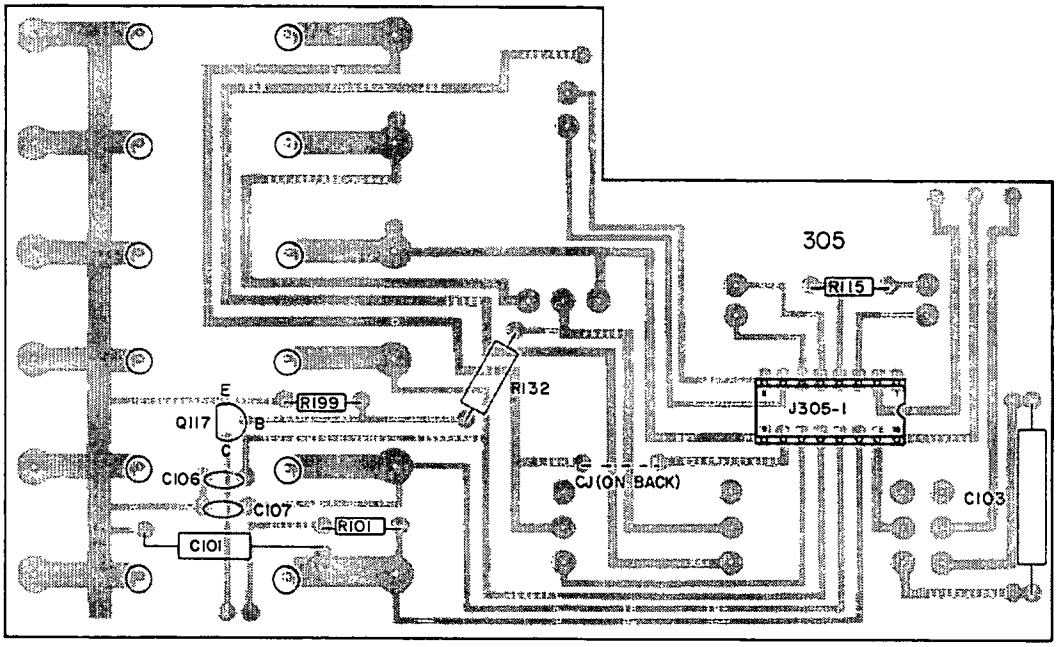


FIGURE 6-12 P.C. BOARD ASSEMBLY, BOARD 305, DRAWING

THIS PAGE IS RESERVED

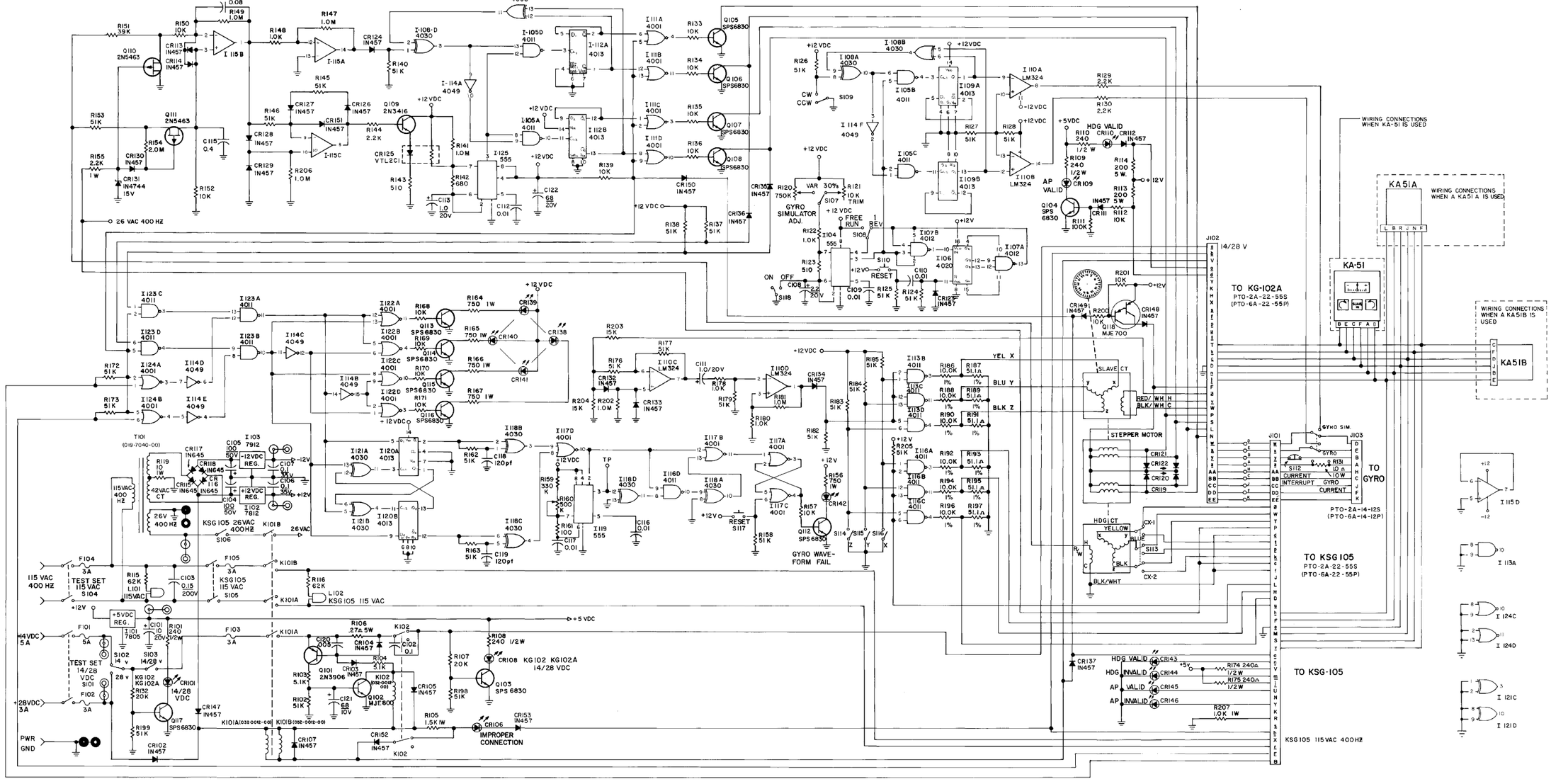


FIGURE 6-13 KTS 152 SCHEMATIC
(Dwg. 002-00435-0000 Rev. 6)

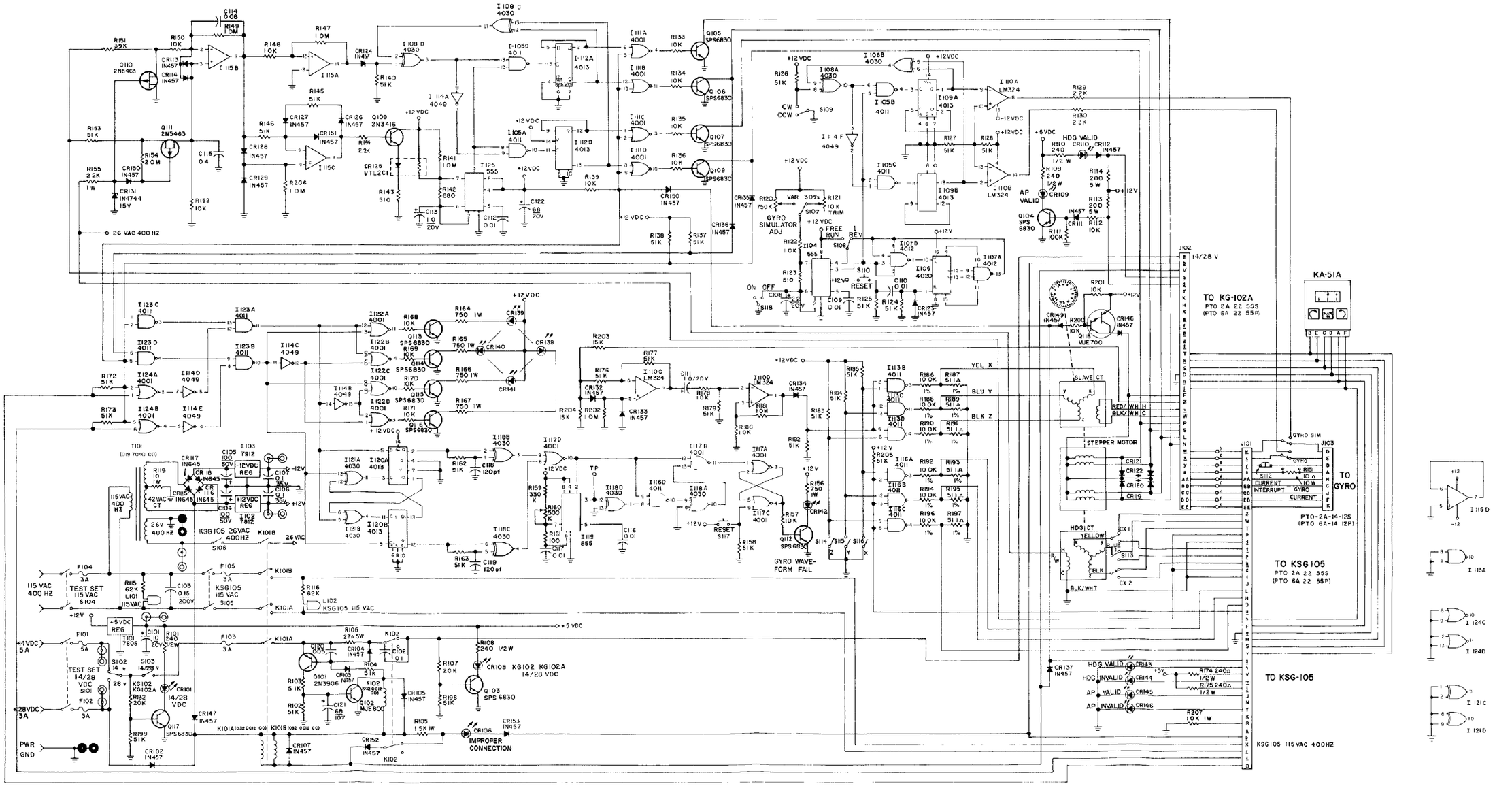


FIGURE 6-13A KTS 152 SCHEMATIC
(Dwg. 002-00435-0000 Rev. 5)

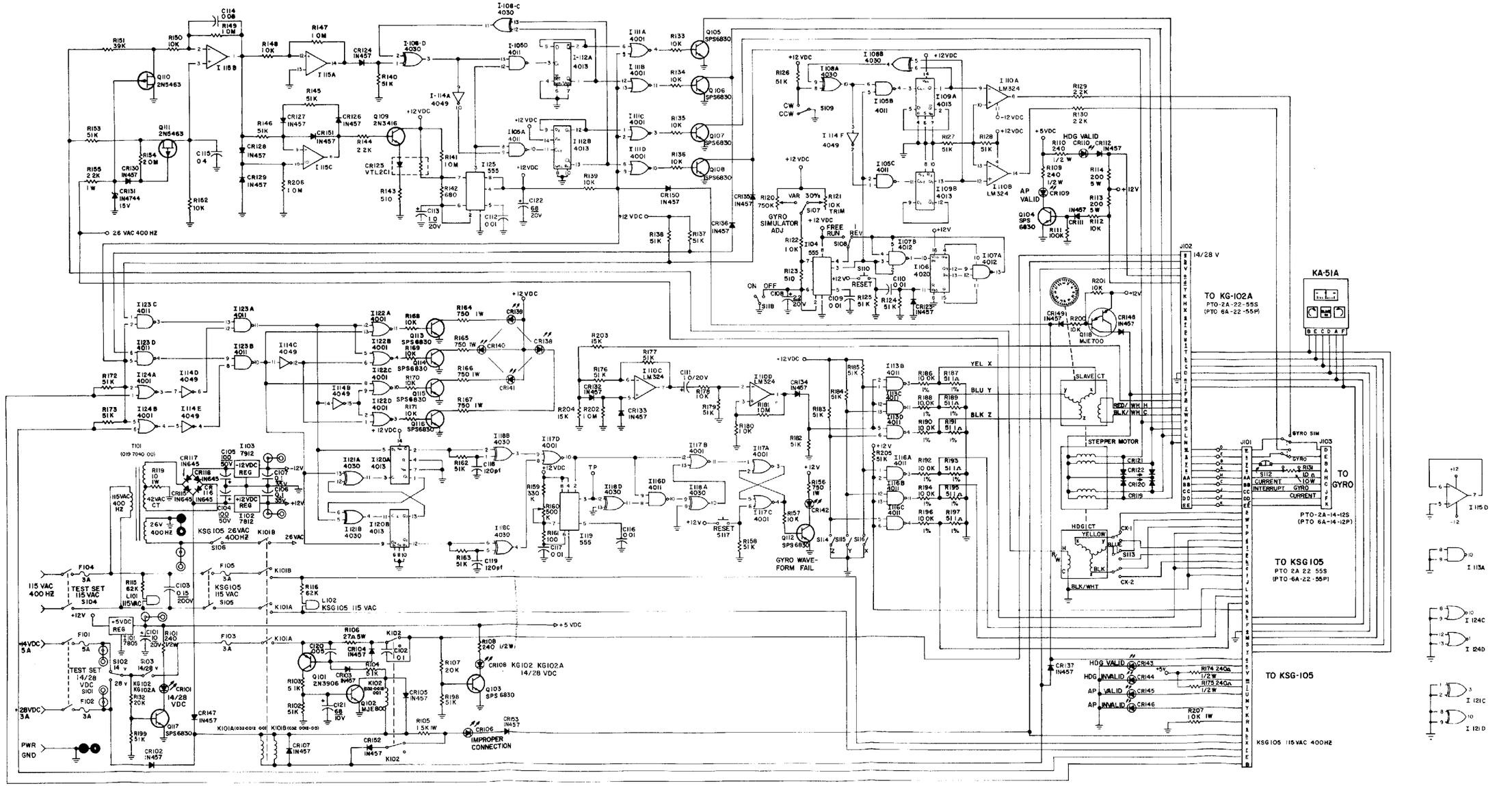


FIGURE 6-13B KTS 152 SCHEMATIC
(Dwg. 002-00435-0000 Rev. 4)