TOTAL SHEETS - 38

| REVISIONS | | | |
|---|---|---|---|
| LTR | DESCRIPTION | DATE | APPROVED |
| A | Specification revised per ECR 80-11-017. | 12 NOV 1980 | JRK LEW |
| B | Specification revised per ECR 81-02-004. | 12 FEB 1981 | JRK |
| C | Specification revised per ECR 81-02-006. | 16 FEB 1981 | JRK |
| D | Specification revised per ECR 81-06-030. | 23 JUN 1981 | JRK |

THIS SPECIFICATION COVERS THE TEST REQUIREMENTS FOR CONTINENTAL ELECTRONICS TYPE 314R-1, PART NUMBER 622-5273-001, 1 KILOWATT AM BROADCAST TRANSMITTER.

(FORMERLY TYPE 828C-1)

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| REV. | A | A | C | A | A | C | A | A | A | B | A | A | A | A | | | | | | | | | | |
| SHEET | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| REV STATUS OF SHEETS | REV | D | A | A | A | C | A | C | A | A | A | A | A | A | A | A | A | A | A | D | A | A | A | A |
| | SHEET | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |

CONTRACT NO.

PREP F. M. CUMMINGS

CHK L. E. WINTER

APVD L. E. WINTER LEW

CONTINENTAL ELECTRONICS MFG. CO.
DALLAS, TEXAS

PRODUCTION TEST REQUIREMENTS
FOR
314R-1 1 kW AM TRANSMITTER
CPN 622-5273-001

| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |

SCALE

SHEET 1 of 38

074-5225-050 (7-74)

NEXT ASSY :

TYPE NO:

FRO NEP REL REV TC CR NR DL TO

INDEX



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|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 2 |

074-5225-051

1.0 SCOPE

THIS PRODUCTION TEST REQUIREMENT APPLIES TO THE CONTINENTAL ELECTRONICS TYPE 314R-1, 1kW AM TRANSMITTER, CPN 622-5273-001.

2.0 REFERENCE PUBLICATIONS

| | | |
|---|---|---|
| 314R-1 | EQUIPMENT SPECIFICATION | CPN 670-7253-001 |
| 314R-1 | SCHEMATIC DIAGRAM | CPN 650-2901-001 |
| 314R-1 | INSTRUCTION MANUAL | |

| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
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| | |
|---|---|
| 9.0 | DIAGRAMS AND TEST SETUPS |
| 9.1 | OUTPUT NETWORK SIMPLIFIED SCHEMATIC |
| 9.2 | METER CALIBRATION AND HVPS OVERLOAD |
| 9.3 | 828C-1 NETWORK TUNING CHART |
| 9.4 | 828C-1 TUNING CAPACITOR CURVE |
| 9.5 | NODE IMPEDANCE CURVE |
| 9.6 | NODE 1 CAPACITY CURVE |
| 9.7 | NODE 1 COIL CURVE |
| 9.8 | NODE 2 COIL CURVE |
| 9.9 | NODE 2-3 COUPLING COIL CURVE |
| 9.10 | NODE 3 COIL CURVE |
| 9.11 | NODE 4 COIL CURVE |

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3.0 TEST EQUIPMENT REQUIRED:

THE FOLLOWING TEST EQUIPMENT OR ITS EQUIVALENT IS REQUIRED TO PERFORM THE ADJUSTMENTS AND TESTS DESCRIBED HEREIN:

OSCILLOSCOPE, TEKTRONIX T-922

PROBES, TEKTRONIX (10:1) (QTY. 2)

DISTORTION ANALYZER, SOUND TECH 1710A

COUNTER, HP-5232A

RF AMMETER (10A FS), CALIBRATED AT 5A

VECTOR IMPEDANCE METER, HP-4815A

CLAMP-ON AMMETER, AMPROBE INSTRUMENTS RS-300

PRECISION DC AMMETER, SINGER MODEL N, 3A FS

PRECISION DC VOLTMETER, SINGER MODEL N, 3A FS

2.5 KW, 50 DUMMY LOAD

TRIPLETT MULTIMETER, MODEL 630

FUNCTION GENERATOR, HP-3312A

POWER FUPPLY, 28V @ 2A ADJUSTABLE, HARRISON 6291A

FIBER OPTIC TEST SET

AM MODULATION MONITOR, BELAR MODEL AMM-1, AMM-2 OR AMM-3

PRECISION AC VM (IRON VANE), 7.5V FS, WESTON 904

DIGITAL VOLTMETER, HP-3465A

4.0 INITIAL ADJUSTMENTS (COLD):

BEFORE PROCEEDING WITH ANY ADJUSTMENTS, MAKE A MECHANICAL INSPECTION OF THE ENTIRE TRANSMITTER TO CHECK TIGHTNESS OF CONNECTIONS, LEAD DRESS (PARTICULARLY IN AREAS OF HIGH VOLTAGE AND RF) PROPER FUNCTIONING OF SHORTING SWITCHES, PROPER MATING OF CONNECTORS, AND CLEANLINESS FROM DEBRIS OR LOOSE MATERIAL THROUGHOUT THE TRANSMITTER INCLUDING THE BLOWER.

THE FOLLOWING INITIAL ADJUSTMENTS ARE TO BE MADE WITH ALL POWER DISCONNECTED FROM THE EQUIPMENT:

4.1 TRANSFORMER TAPS:

SET THE FOLLOWING TRANSFORMER PRIMARY CONNECTIONS TO THE 208 VOLT OR 210 VOLT TAPS (WHEN USED ON FACTORY 208 VOLT 4-WIRE WYE POWER SOURCE):

T1 PLATE TRANSFORMER

T4 RF DRIVER TRANSFORMER

T5 BIAS TRANSFORMER

T9 PA FILAMENT TRANSFORMER ) SET FILAMENT TRANSFORMER
T10 MOD FILAMENT TRANSFORMER ) TAPS FOR 115V IF FILAMENT REGULATOR OPTION IS USED.

FOR OTHER VOLTAGES SEE CHARTS IN 314R-1 INSTRUCTION MANUAL.

4.2 INITIAL POT SETTINGS:

SET THE IPL SWITCH (A1S10) TO THE "OFF" POSITION.

SET BOTH THE PA (R16) AND MOD (R15) FILAMENT ADJUST POTENTIOMETERS TO THEIR CCW POSITIONS.

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|---|---|---|
| A | 152151 | 669-8887-001 |
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4.3 INITIAL WIRING CHECKS:

PRIOR TO CONNECTING AC POWER TO THE TRANSMITTER, PERFORM THE FOLLOWING TESTS:

VERIFY THE CORRECTNESS PER THE SCHEMATIC OF THE MAIN AC POWER WIRING, THE HIGH VOLTAGE POWER SUPPLY WIRING INCLUDING THE METERING/OVERLOAD RESISTORS, AND THE BIAS POWER SUPPLY WIRING TO THE SWITCHMOD CARD (A2) CONNECTOR.

4.4 OUTPUT NETWORK TUNING:

4.4.1 ADJUSTMENT OF THE OUTPUT NETWORK USING THE R.F. VECTOR IMPEDANCE METER:

THE OUTPUT NETWORK MUST BE ADJUSTED TO PRESENT THE PROPER IMPEDANCE TO THE PA TUBE PLATES, TO OBTAIN THE REQUIRED PASSBAND AND TO PROVIDE THE NECESSARY HARMONIC ATTENUATION. TO ACCOMPLISH THIS, THE NETWORK SHOULD BE ADJUSTED BY MEASURING AND ADJUSTING THE NODE IMPEDANCE TO SPECIFIED VALUES AT EACH OF THE NODES OF THE NETWORK.

PRELIMINARY ADJUSTMENT OF THE NETWORK TAPS SHOULD BE MADE AS INDICATED IN FIGURES 1, 3, 4, 5, 6, 7 AND 8. THIS PROVIDES A ROUGH ADJUSTMENT. THE PROCEDURE FOR FINE ADJUSTMENT REQUIRES THE USE OF THE VECTOR IMPEDANCE METER.

DISCONNECT THE STRAP FROM C30 TO L1 AND THEN MEASURE THE IMPEDANCE FROM TP1 TO GROUND. ADJUST THE VARIABLE CAPACITOR C30 TO GIVE A TOTAL TUNING CAPACITOR IMPEDANCE OF 348/-90 C OHMS. THIS INCLUDES THE PADDING CAPACITOR C31 IF USED. RECONNECT STRAP TO C30 AND L1.

MEASURE THE IMPEDANCE OF THE DUMMY LOAD FOR VERIFICATION OF ITS IMPEDANCE (50/0 OHMS) AND CONNECT IT TO THE OUTPUT CONNECTION OF THE NETWORK.

123,258/0.066° CONNECT A SHORT CLIP LEAD FROM TP2 TO GROUND, SHORTING OUT NODE 2 AND MEASURE IMPEDANCE OF NODE 3 AT TP3. ADJUST THIS IMPEDANCE TO THE VALUE SHOWN FOR R33 (SEE FIGURE 9) WITH A ZERO PHASE ANGLE. ADJUST THE RESISTIVE COMPONENT BY VARYING THE POSITION OF STRAP 6 AND ADJUST THE PHASE ANDLE TO 0 DEGREES BY VARYING THE POSITION OF STRAP 5. 123Ω

212.516°/-0.094° MOVE THE SHORTING CLIP LEAD FROM TP2 AND GROUND TO TP1 AND GROND. CONNECT THE VECTOR IMPEDANCE METER BETWEEN TP2 AND GROUND. ADJUST THE IMPEDANCE AT THIS POINT TO THE VALUE SHOWN FOR R22 (SEE FIGURE 10) WITH ZERO PHASE ANGLE.

212Ω

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|---|---|---|
| A | 152519 | 669-8887-001 |
| SCALE | REV A | SHEET 8 |

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ADJUST STRAP 4 TO VARY THE IMPEDANCE MAGNITUDE AND STRAP 3 TO ADJUST THE PHASE ANGLE TO ZERO. SOME INTERACTION WILL BE NOTED. REMOVE THE SHORTING CLIP LEAD.

CONNECT THE VECTOR IMPEDANCE METER TO TP4 AT THE PLATE OF THE PA TUBE.

ADJUST STRAP 1 AND STRAP 2 TO YIELD AN IMPEDANCE OF 4400/0° OHMS AT TP4. STRAP 2 WILL AFFECT THE MAGNITUDE AND STRAP 1 THE PHASE ANGLE. HOWEVER, SOME INTERACTION WILL BE NOTED.

REPEAT THE PRECEDING ADJUSTMENTS FROM THE BEGINNING TO CORRECT FOR INTERACTION OF ADJUSTMENTS MADE IN ONE NODE TO THE IMPEDANCE MEASURED IN THE ADJACENT NODE. FINAL ADJUSTMENT SHOULD YIELD VALUES FOR R33, R22, AND THE IMPEDANCE AT THE PLATES OF THE PA TUBES AS SHOWN IN FIGURES 9 AND 10 AND THE PRECEDING PARAGRAPHS.

CHECK THE LOAD IMPEDANCE OVER A BANDWIDTH ±10 KHZ FROM CARRIER FREQUENCY. USE THE FREQUENCY COUNTER TO DETERMINE THE EXACT FREQUENCIES. THE LOAD IMPEDANCE SHOULD NOT DEVIATE MORE THAN 300 ±20 FROM THAT AT CARRIER FREQUENCY.

REMOVE ALL TEST CLIPS AND INSTRUMENTS.

4.4.2 OPTIONAL OUTPUT NETWORK ADJUSTMENT PROCEDURE:

THE FOLLOWING PROCEDURE USES THE GR 1606 RF BRIDGE.

IN ORDER TO PROPERLY TUNE THE OUTPUT NETWORK, IT IS NECESSARY TO BRIDGE THE NETWORK AT VARIOUS POINTS IN THE CIRCUIT AND TO MAKE FINE ADJUSTMENTS OF THE NETWORK COMPONENTS TO GIVE CORRECT IMPEDANCE VALUES, ONCE THE PRELIMINARY ADJUSTMENTS HAVE BEEN MADE.

BEGIN BY MAKING THE PRELIMINARY ADJUSTMENTS INDICATED IN GIFURES 1, 3, 4, 5, 6, 7 AND 8. DISCONNECT THE STRAP FROM C30 TO L1 AND THEN BRIDGE FROM TP1 TO GROUND. ADJUST THE VARIABLE CAPACITOR SO AS TO RENDER 348 OHMS REACTANCE. RECONNECT STRAP C30 TO L1.

PLACE SHORTING CLIP LEAD FROM TP2 TO GROUND AND BRIDGE FROM TP3 TO GROUND. VARYING RESISTANCE WITH STRAP 6 AND REACTANCE WITH STRAP5, ADJUST STRAP 5 AND STRAP 6 FOR A BRIDGE READING OF ZERO OHMS REACTANCE AND A RESISTANCE R33 (SEE FIGURE 9).

MOVE SHORTING CLIP LEAD FROM TP1 TO TP3 AND GROUND AND INSTALL A 4400 OHM RESISTOR FROM TP4 TO GROUND. VARYING RESISTANCE WITH STRAP 2 AND REACTANCE WITH STRAP 1, ADJUST STRAP 2 AND STRAP 1 FOR A BRIDGE READING OF ZERO OHMS REACTANCE AND A RESISTANCE VALUE R22 (SEE FIGURE 10).

REMOVE THE 4400 OHM RESISTOR, SHORTING CLIP LEAD, AND BRIDGE FROM THE RADIO.

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FIGURE 1
SIMPLIFIED SCHEMATIC
OUTPUT NETWORK

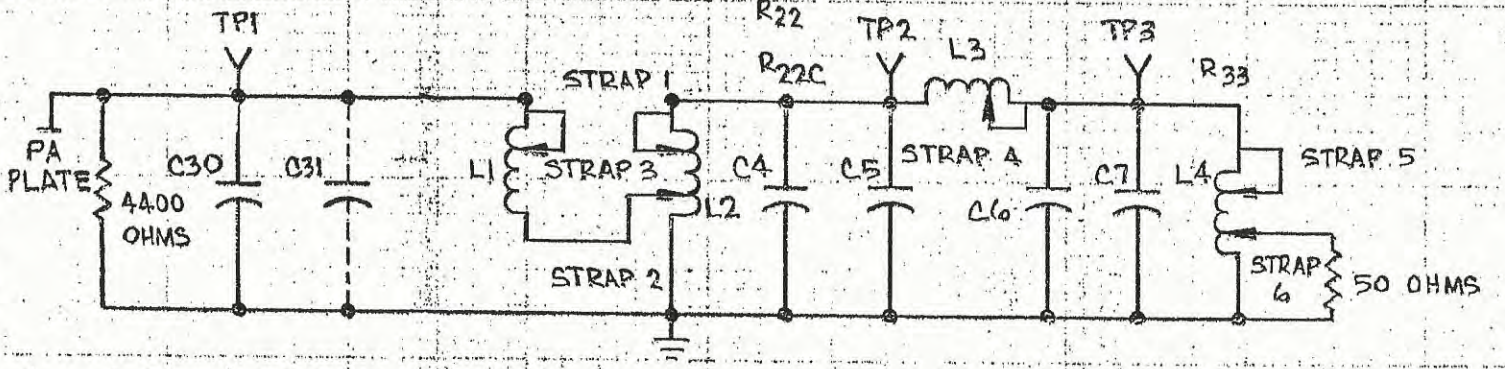
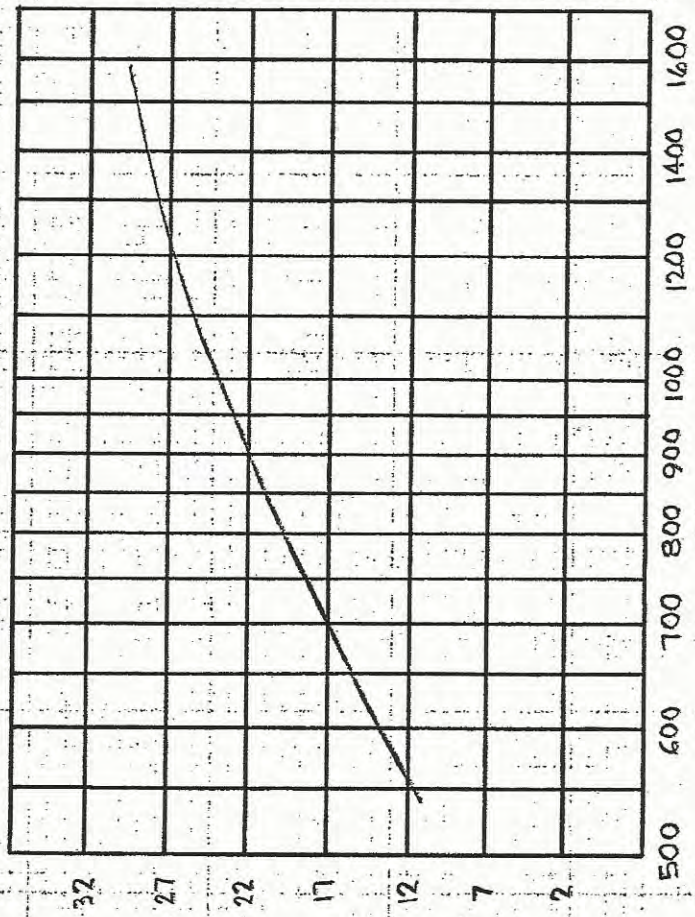



TABLE 2
OUTPUT NETWORK
CAPACITOR VALUES

| FREQ | C31 | C4 | C5 | C6 | C7 |
|---|---|---|---|---|---|
| 540-700 | 430 PF | 3900 PF | 3900 PF | 3900 PF | 3900 PF |
| 710-920 | 240 PF | 3000 PF | 3000 PF | 3000 PF | 3000 PF |
| 930-1150 | 180 PF | 2400 PF | 2400 PF | 2400 PF | 2400 PF |
| 1160-1380 | NONE | 2000 PF | 2000 PF | 2000 PF | 2000 PF |
| 1390-1600 | NONE | 1600 PF | 1600 PF | 1600 PF | 1600 PF |

| SIZE | CODE IDENT NO | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 10 |

FIGURE 3
APPROXIMATE SETTINGS
FOR STRAP 1




| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 11 |

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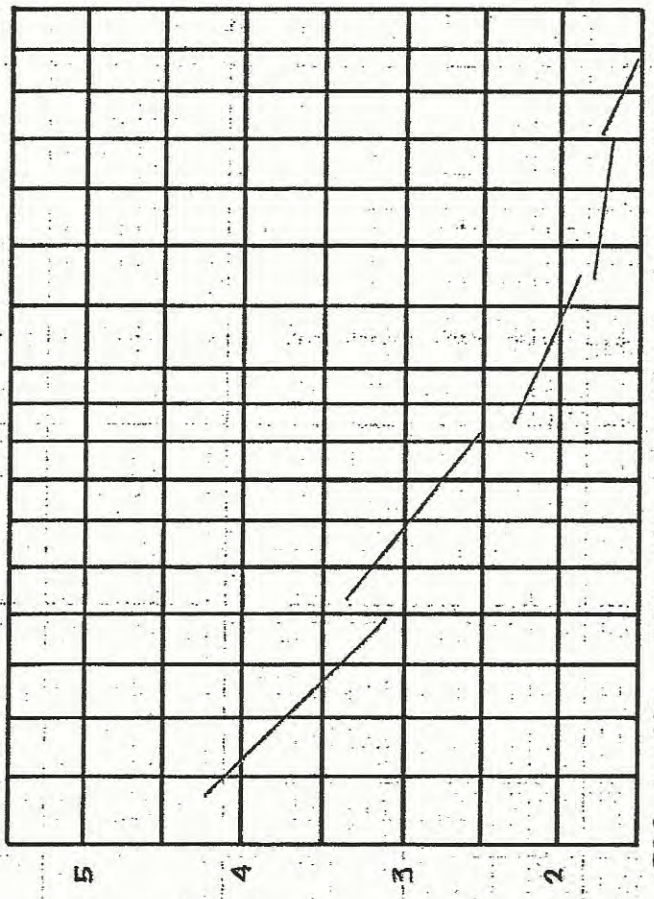


FIGURE 4
APPROXIMATE SETTINGS
FOR STRAP 2

| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 12 |

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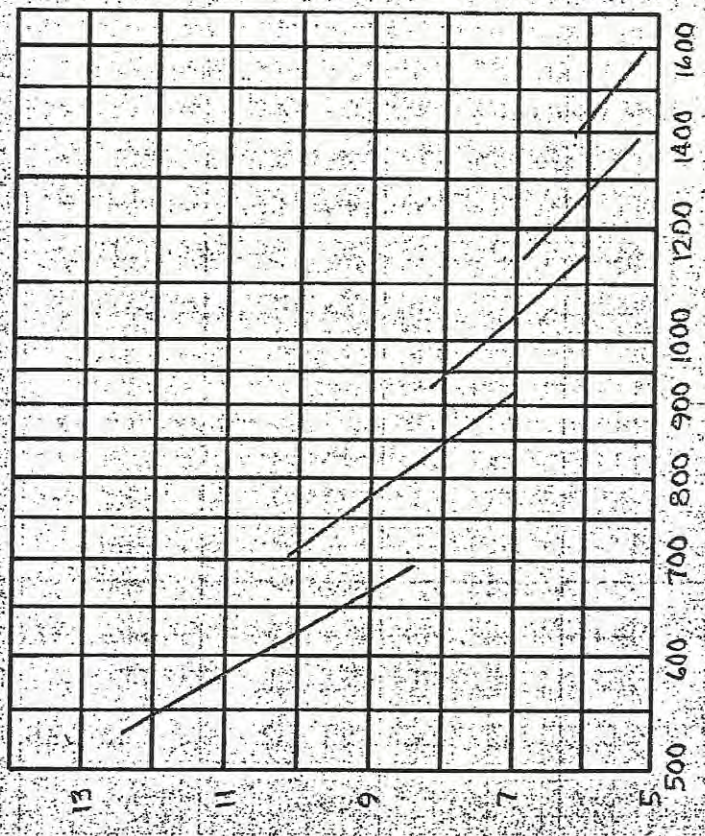
FIGURE 5
APPROXIMATE SETTINGS
FOR STRAP 3




| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 13 |

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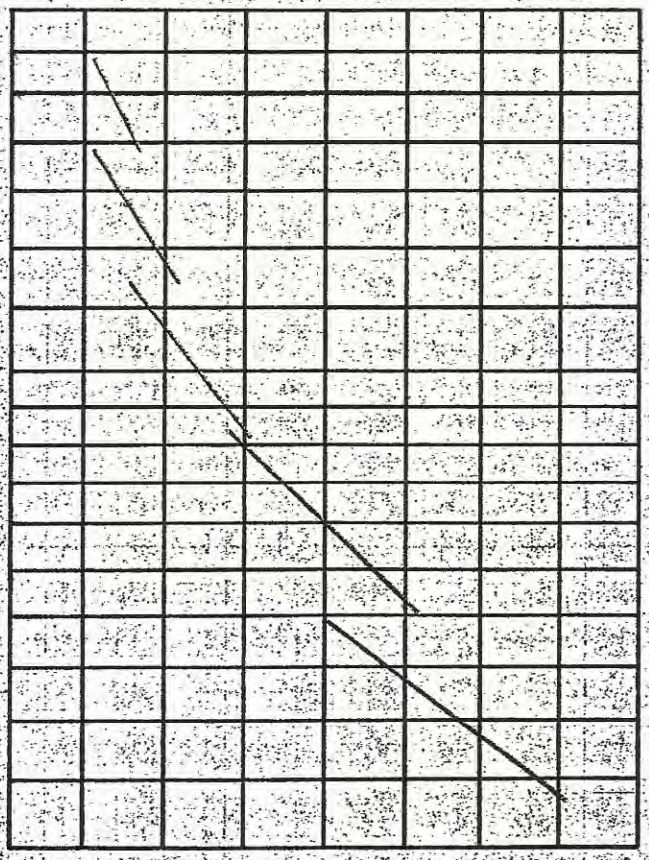
FIGURE 6
APPROXIMATE SETTINGS
FOR STRAP 4




| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 14 |

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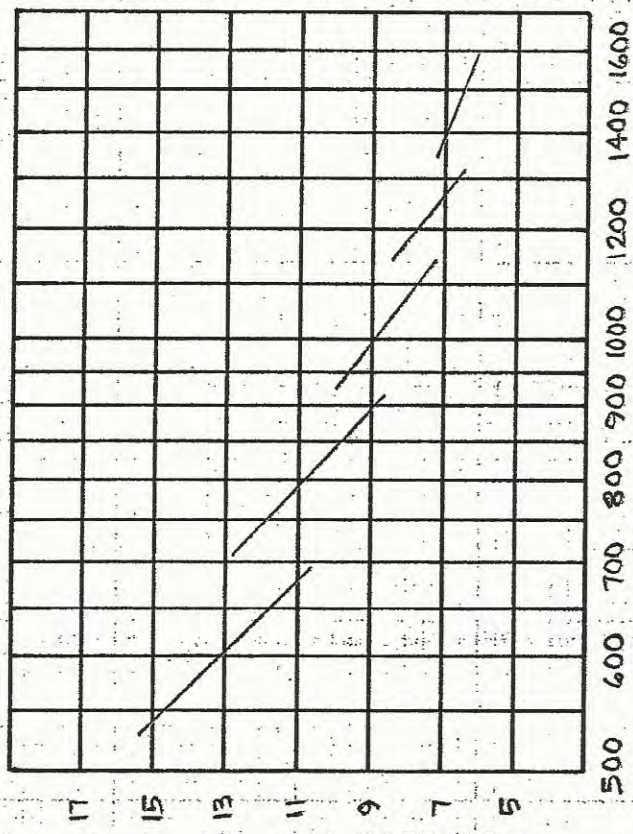
FIGURE 3
APPROXIMATE SETTINGS
FOR STRAP 5




| SIZE | CODE IDENT NO | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 15 |

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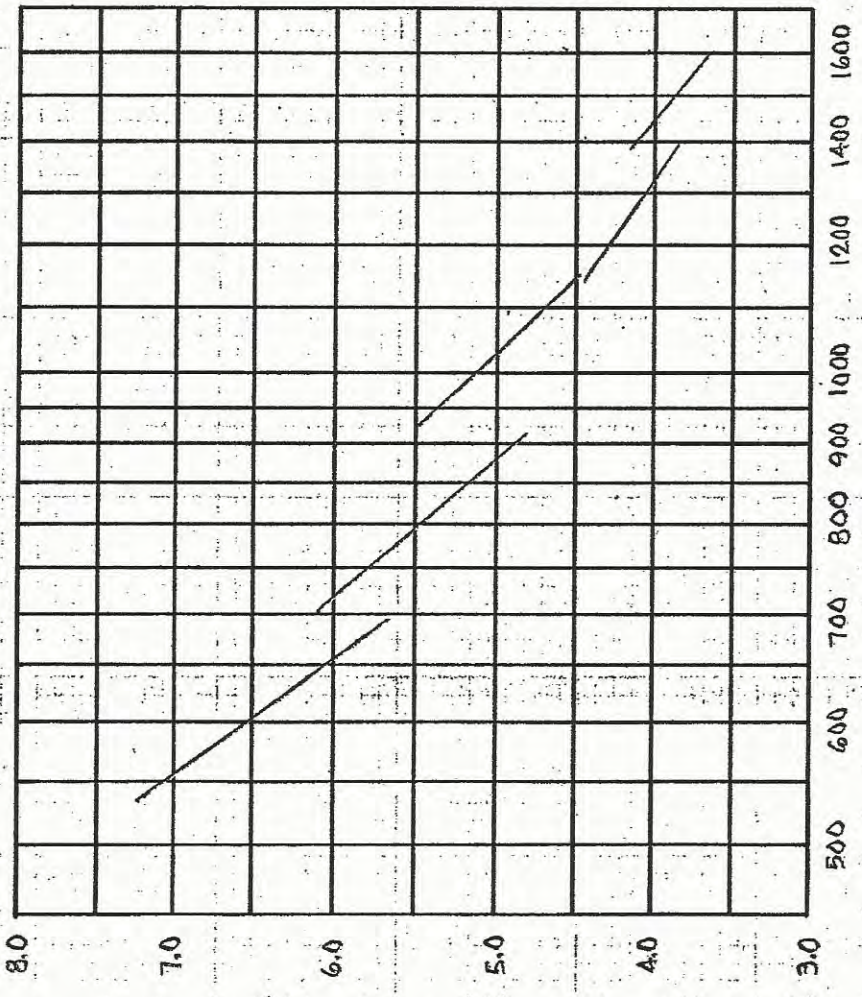
FIGURE 8
APPROXIMATE SETTINGS
FOR STRAP 6




| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 16 |

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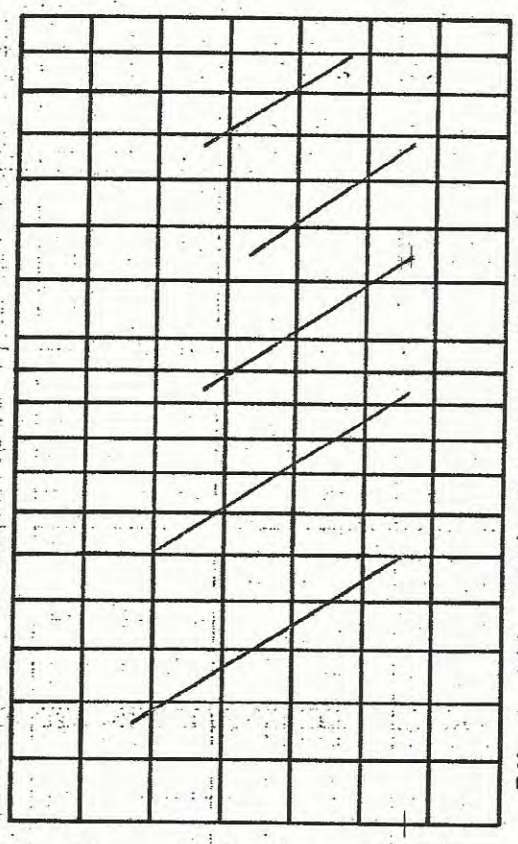
FIGURE 9
R33 VALUES




| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 17 |

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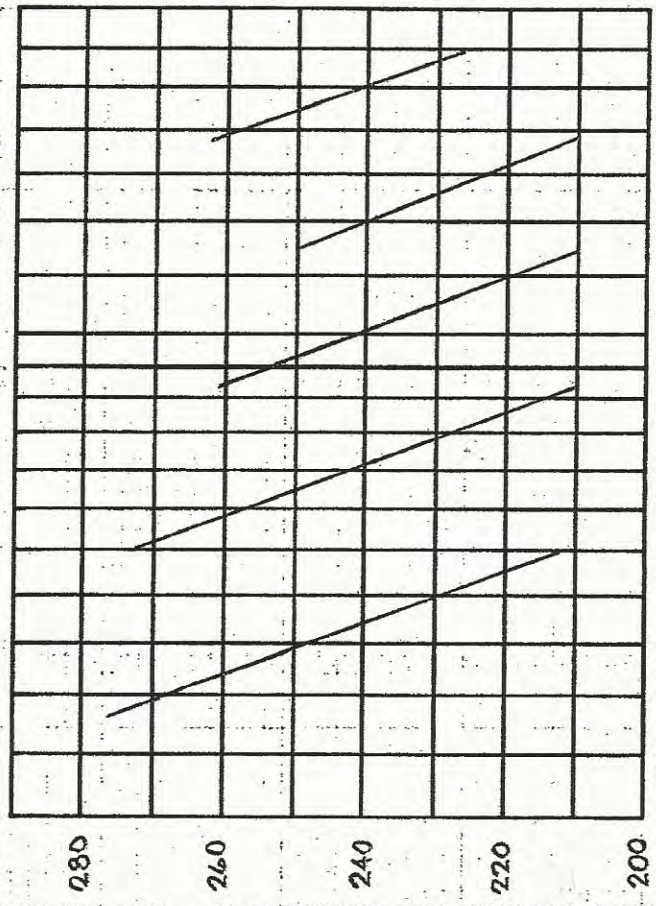


FIGURE 10
R22 VALUES
R22 - R22C

| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 18 |

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4.5 ARC GAP SETTINGS:

ADJUST THE RF ARC SENSOR ARC GAP E20 FOR A SPACING OF .194 INCHES. ADJUST THE ARC GAPS ON A9T1 TO A SPACING OF .010 INCHES EACH (E46, 47).

ADJUST THE FRONT (TO GROUND) MODULATOR ARC GAP TO ~~.194~~ .155 INCHES (E19A). ADJUST THE REAR (TO HV) MODULATOR ARC GAP TO .194 INCHES (E19B).

4.6 PA GRID RESISTOR:

ADJUST THE TAP ON THE PA GRID RESISTOR R24 TO OBTAIN A VALUE OF 250 OHMS.

5.0 PRELIMINARY ADJUSTMENTS (FILAMENTS ON):

THE FOLLOWING ADJUSTMENTS SHOULD BE MADE WITH FILAMENT POWER APPLIED TO THE EQUIPMENT. ALL FUSES (EXCEPT THE DRIVER P.S.) SHOULD BE INSTALLED, THE LOW VOLTAGE CIRCUIT BREAKER ON AND THE HV CIRCUIT BREAKER OFF. IN THIS CONDITION THE FILAMENT OFF LIGHT AND THE PLATE OFF LIGHT SHOULD BOTH BE ON. ±PA bias

PRESS THE "FILAMENT ON" SWITCH. THE FILAMENT OFF LIGHT SHOULD GO OUT AND THE FILAMENT ON LIGHT SHOULD COME ON AND THE BLOWER SHOULD BE ON.

THE DUMMY LOAD INTERLOCK SHOULD BE CONNECTED BETWEEN TERMINALS 12 AND 13 ON A1TB1.

ADJUST THE AIR SWITCH S6 TO ACTUATE WITH THE BLOWER ON AND THE FRONT PANEL CLOSED. BACK OFF THE ADJUSTMENT SLIGHTLY AND VERIFY THAT THE AIR SWITCH OPERATES CORRECTLY (OPENS) WHEN THE PANEL IS OPENED. IT MAY BE NECESSARY TO ADJUST THE LOCATION OF THE MICROSWITCH MOUNTING ON THE AIR SWITCH ASSEMBLY TO GET THE PROPER TRAVEL ON THE DIAPHRAM SO THE AIR SWITCH CAN BE SET CORRECTLY. BE CERTAIN THAT THE MICROSWITCH IS SECURELY FIXED IN POSITION EVEN IF NO ADJUSTMENT IS REQUIRED. ALSO VERIFY THAT THE BLOWER IS ROTATING THE RIGHT DIRECTION TO GET FULL AIR FLOW. A VERY QUIET BLOWER IS PROBABLY GOING THE WRONG WAY.

5.1 FILAMENT VOLTAGE:

CONNECT A TEST METER TO THE PA FILAMENTS AND ADJUST THE PA FILAMENT ADJUST (R16) TO OBTAIN 4.8V ON THE TEST METER.

CONNECT A TEST METER TO THE MOD FILAMENT AND ADJUST THE MODULATOR FILAMENT ADJUST (R15) TO OBTAIN 4.8V ON THE TEST METER.

IF THE FILAMENT REGULATOR OPTION IS INSTALLED (T2) IT MUST BE CONNECTED AND THE JUMPER ON TB3 REMOVED. MEASURE THE AC VOLTAGE OUTPUT ON TERMINALS 1 AND 3 OF TB3. RESET THE PA FILAMENT TRANSFORMER TAPS TO ~~230~~ 115V TAP (SEE PARAGRAPH 4.1).

5.2 TEST METER READINGS:

CHECK THE DC TEST METER FOR THE FOLLOWING APPROXIMATE READINGS TO VERIFY THAT THE LVPS ARE FUNCTIONING PROPERLY.

| POSITION | READING |
|---|---|
| -12 | 12 |
| - 6 | 6 |
| + 5 | 5 |
| +12 | 12 |
| +28 | 28 |
| Ecc | 0 |
| Ic | 0 |
| HV | 0 (PLATE OFF) |
| FWD | 0 |
| REF | 0 |

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|---|---|---|
| A | 52151 | 669-8887-001 |
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5.3 PLATE CURRENT METER AND HVPS OVERLOAD:

TURN THE POWER TO THE EQUIPMENT OFF AND CONNECT THE ADJUSTABLE 28 V POWER SUPPLY AS SHOWN IN FIGURE 11. TURN THE LOW VOLTAGE CIRCUIT BREAKER ON.

ADJUST THE 28 V POWER SUPPLY TO OBTAIN 0.5 AMPS DC AS INDICATED ON THE PRECISION AMMETER. THE FRONT PANEL PLATE CURRENT METER (M2) SHOULD INDICATE 0.35 ± 2% AMPS.

WITH THE RECYCLE SWITCH (A1S9) IN THE "OFF" POSITION, SET THE 28V POWER SUPPLY TO OBTAIN 0.5 AMPS DC AS INDICATED ON THE PLATE CURRENT METER (M2) AND ADJUST THE HVPS O/L ADJUSTMENT A1R11 UNTIL THE HVPS O/L INDICATOR (A1CR9) LIGHTS. REPEAT BY INCREASING THE CURRENT SLOWLY TO 0.5 AMPS TO BE SURE THE TRIP POINT IS ACCURATELY SET.

5.4 BIAS POWER SUPPLY:

DANGER !!!

FOR THIS TEST BE SURE THAT THE HVPS CIRCUIT BREAKER (CB2) IS IN THE "OFF" (DOWN) POSITION!!!

WITH THE HVPS CIRCUIT BREAKER CB2 OFF AND THE PLATE OFF, MEASURE THE PLUS AND MINUS 125V OUTPUT OF THE BIAS POWER SUPPLY MEASURE FROM A6TB1-4. SWITCHMOD CARD SHOULD BE INSTALLED FOR THIS TEST. BIAS PS IS ENERGIZED WHEN FILAMENTS ARE ON.

5.5 SWITCH FREQUENCY:

USING A SCOPE PROBE FEEDING THE FREQUENCY COUNTER, ATTACH THE PROBE (10:1) TO A1TP17 NEAR TERMINAL 4 OF A1U19 (μA 710 COMPARATOR). THIS MEASURES THE TRIANGLE OUTPUT FROM THE FUNCTION GENERATOR A1U22. ADJUST THE "SWITCH FREQUENCY ADJUST" CONTROL A1R148 TO SET THE FREQUENCY TO 70.0 KHZ. COVER MUST BE REMOVED FROM A1 (PWM CARD) FOR THIS ADJUSTMENT.

5.6 RF EXCITER FREQUENCY:

CONNECT THE COUNTER TO THE FREQUENCY MONITOR JACK J3. SET THE "OSCILLATOR FREQUENCY ADJUST" CONTROL (A3C4) FOR THE DESIRED OUTPUT FREQUENCY. MAKE SURE A3 IS STRAPPED FOR THE CORRECT DIVISION (1080 KHZ OR ABOVE ÷2, JUMPER 1 & 3, BELOW 1080 KHZ ÷4, JUMPER 1 & 2 AND 3 & 4).

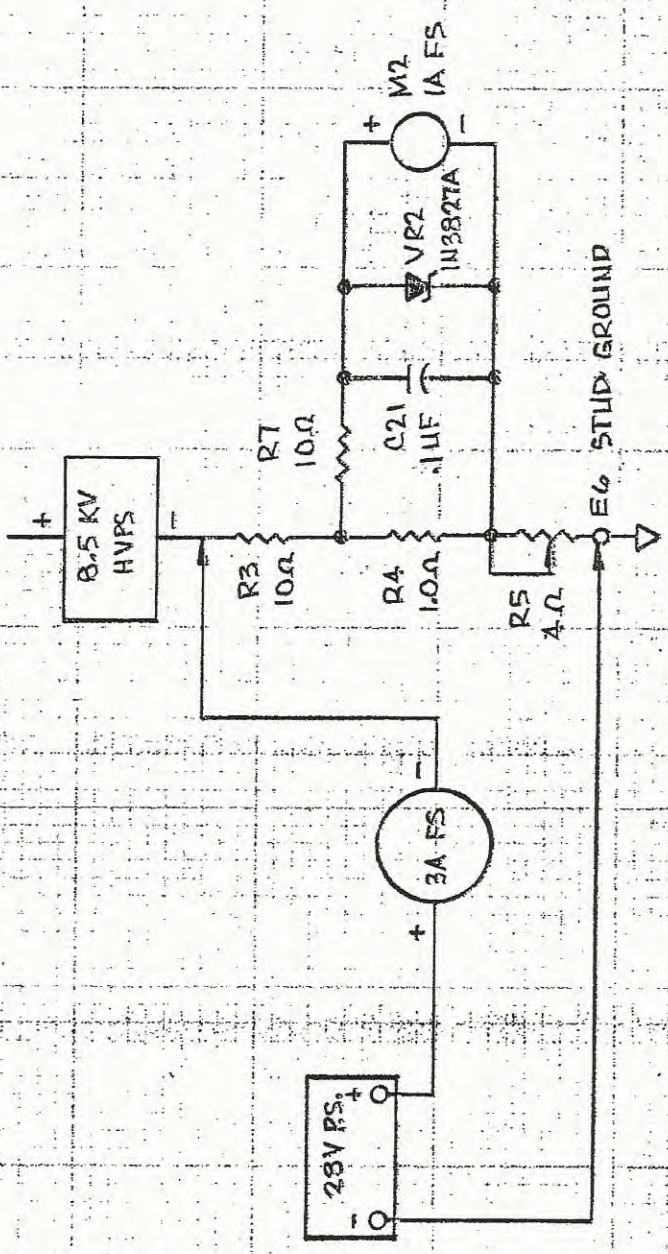


FIGURE 11 METER CALIBRATION AND HVPS OVERLOAD

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|---|---|---|
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5.7 RF PULSE WIDTH:

CONNECT A SCOPE TO A3TP6 ON THE RF EXCITER CARD. ADJUST THE "PULSE WIDTH" CONTROL A3R8 FOR A 120° (1/3) WIDE POSITIVE GOING PULSE.

5.8 DC REFERENCE:

MEASURE THE DC (+) VOLTAGE TO GROUND AT TERMINAL B16 OF THE CONTROL CIRCUIT CARD. USING THE FRONT PANEL "RAISE" AND "LOWER" SWITCHES ADJUST THE VOLTAGE TO +1.5V. NOTE THAT THE LIGHTS IN THE SWITCHES ARE TURNED ON WHEN THE BUTTON IS DEPRESSED. THIS WILL SET THE PLATE VOLTAGE TO APPROXIMATELY 1.5 kV FOR THE NEXT STEP IN THIS PROCEDURE. ALSO MAKE SURE THAT THE LOW POWER ADJUST A1R126 ON THE CONTROL CIRCUIT CARD IS SET IN ITS MAX CCW POSITION.

5.9 RF DRIVER OVERCURRENT:

TURN FIL OFF, INSERT DRIVER P.S. FUSE. TURN FIL ON AND OBSERVE THE RF DRIVER $I_C$ (0.75 AMPS) ON THE MULTIMETER. ADJUST THE OVERCURRENT TRIP ADJUSTMENT A3R19 (RF EXCITER MODULE) CW UNTIL THE RF DRIVER $I_C$ SHUTS OFF. BACK OFF IN THE CCW DIRECTION UNTIL THE DRIVER TURNS BACK ON AGAIN (APPROXIMATELY 3 TURNS).

6.0 FINAL ADJUSTMENTS (HP AND LP):

DANGER!!!

BEFORE DISCONNECTING OR RECONNECTING ANY COMPONENT IN THE TRANSMITTER, USE THE SHORTING STICK TO BE SURE CIRCUIT IS SAFE.

THE FOLLOWING ADJUSTMENTS SHOULD BE MADE WITH ALL FUSES INSTALLED, ALL CIRCUIT BREAKERS (LV AND HV) ON, AND THE TRANSMITTER RF OUTPUT CONNECTED INTO THE DUMMY LOAD. THE DUMMY LOAD INTERLOCK SHOULD BE CONNECTED BETWEEN TERMINALS 12 AND 13 ON A1TB1. IN THIS CONDITION THE FILAMENT OFF LIGHT AND THE PLATE OFF LIGHT SHOULD BOTH BE ON.

FOR THE INITIAL TURN ON OF HV THE FOLLOWING PROCEDURE SHOULD BE USED: REMOVE THE RF DRIVER FUSE. CONNECT THE PLATE OF THE PA TUBE TO GROUND (CHASSIS) THROUGH A SHORT (NOT LONGER THAN 6 INCHES) CLIP LEAD. CONNECT THE COLLECTOR OF A1Q24 ON THE CONTROL CARD TO GROUND WITH A CLIP LEAD TO BYPASS THE RF DRIVER CURRENT DE-KEY CIRCUIT.

PRESS THE "FIL ON" SWITCH. VERIFY THAT THE RF DRIVER IC IS ZERO. OBSERVE THE HV ON THE MULTIMETER. IT SHOULD BE ZERO. PRESS THE "LP ON" SWITCH. THE HV SHOULD COME ON. THE PLATE VOLTAGE AND PLATE CURRENT SHOULD STILL READ ZERO. SLOWLY TURN THE LOW POWER ADJUSTMENT, A1R126, CW UNTIL THE PLATE VOLTAGE BEGINS TO RISE ABOVE ZERO. ADJUST IT UNTIL THE PLATE VOLTAGE READS APPROXIMATELY 1kV. AT THIS POINT THE PLATE CURRENT SHOULD BE APPROXIMATELY 250 ma. PRESS THE "HP ON" SWITCH. THE PLATE VOLTAGE SHOULD INCREASE TO ABOUT 2.0 kV. AT THIS TIME THE PLATE CURRENT SHOULD BE APPROXIMATELY 400 ma. NO RF POWER OUTPUT SHOULD BE PRESENT.

THE ABOVE PROCEDURE VERIFIES THE BASIC OPERATION OF THE 70 kHz SWITCHING MODULATOR USING THE PA TUBE IN ITS ZERO BIAS CONDITION AS A LOAD. AFTER COMPLETION OF THIS PROCEDURE, TURN OFF THE TRANSMITTERS AND RE-INSTALL THE RF DRIVER MODULE, REMOVE THE CLIP LEAD FROM THE PLATE TO GROUND ON THE PA TUBE AND REMOVE THE JUMPER TO GROUND FROM THE COLLECTOR OF A1Q24 ON THE CONTROL CARD.

PRESS THE "HP ON" SWITCH. THE FILAMENT OFF LIGHT SHOULD GO OUT, THE FILAMENT ON LIGHT COMES ON, THE PLATE OFF LIGHT GOES OUT, AND THE HP ON LIGHT COMES ON.

THE PLATE VOLTAGE METER M1 SHOULD INDICATE APPROXIMATELY 3kV, AND THE PLATE CURRENT METER SHOULD READ APPROXIMATELY 0.5A.

IMMEDIATELY ADJUST THE "PA TUNING" C30 FOR THE PLATE CURRENT DIP.

NOTE THE RF POWER OUTPUT BY CHECKING THE LINE CURRENT RF AMMETER. IT SHOULD READ SLIGHTLY ABOVE 4 AMPS.

6.1 PA LOADING AND RF PULSE WIDTH:

> DANGER!!!
>
> USE SHORTING STICK TO REMOVE ANY STORED ENERGY BEFORE CONNECTING OR DISCONNECTING THE HV METER.

TURN THE TRANSMITTER OFF AND CONNECT THE PRECISION HV VOLTMETER FROM T9-5 TO GROUND (-VOLTAGE, GROUND IS+). REAPPLY POWER TO THE TRANSMITTER AND USING THE FRONT PANEL "RAISE" AND "LOWER" SWITCHES, ADJUST THE PLATE VOLTAGE TO OBTAIN 3.0 kV ON THE PRECISION PLATE VOLTAGE METER. THE FRONT PANEL VOLTMETER SHOULD READ 3.0 kV $\pm$ 2%.

AT THIS LEVEL THE PLATE CURRENT SHOULD READ 0.500 AMPS +10 ma. IF THIS PLATE CURRENT IS NOT ACHIEVED, ADJUST THE TAP ON COIL L3 TO EITHER INCREASE OR DECREASE THE LOADING ON THE PA AS NECESSARY TO OBTAIN THE DESIRED CURRENT AT 5.0 kV. INCREASING THE INDUCTANCE OF L3 DECREASES THE LOADING ON THE PA (INCREASES PA PLATE CURRENT AT 3.0 kV).

TURN THE POWER OFF AND REMOVE THE PRECISION DC VOLTMETER.

6.2 LOW POWER AND MOD MONITOR:

SWITCH TO LOW POWER. SET LOW POWER ADJUST A1R126 FOR THE DESIRED POWER OUTPUT AS SPECIFIED IN THE TRANSMITTER WORK ORDER.

ADJUST THE MOD MONITOR TAPS ON THE OUTPUT COIL L4 TO OBTAIN 30 Vpp OUTPUT WHEN CONNECTED TO THE SCOPE AND MOD MONITOR IN BOTH HIGH POWER AND LOW POWER (WITH 50 OHM LOAD).

6.3 OVERLOAD RECYCLE:

USE A TEST LEAD TO GROUND TEST POINT A1TP3(ORG). WITH THE "RECYCLE" SWITCH ON, GROUNDING THIS POINT SHOULD CAUSE THE SWITCHING MODULATOR TO STOP SWITCHING THUS REDUCING THE PLATE VOLTAGE AND RF OUTPUT TO ZERO. REMOVING THE GROUND WILL ALLOW THE OUTPUT TO RETURN TO NORMAL. A SERIES OF FOUR SIMULATED OVERLOADS SHOULD CAUSE THE HV CONTACTOR TO OPEN AND REMOVE THE HV. PUSH THE "HP ON" TO RETURN TO POWER OUTPUT. THE SEQUENCE OF FOUR OVERLOADS MUST OCCUR WITHIN 15 SECONDS OR LESS TO REMOVE THE HV. A SINGLE SIMULATED OVERLOAD SUSTAINED FOR MORE THAN ONE SECOND SHOULD ALSO CAUSE THE HV TO BE REMOVED.

WITH THE "RECYCLE" SWITCH OFF, ANY SINGLE OVERLOAD WILL REMOVE HV.

REMOVING THE DUMMY LOAD INTERLOCK FROM A1TB1-12 SHOULD CAUSE THE SWITCHING TO STOP BUT NOT DROP THE HVPS.

6.4 AUDIO AND CLIPPING LEVELS:

THE CONTROL CIRCUITS CARD (A1) MUST HAVE THE COMMON MODE AND OFFSET ADJUSTMENTS COMPLETED PRIOR TO THESE TESTS.

6.4.1 AUDIO TRACKING:

DURING THIS TEST USE A LOW POWER LEVEL OF 250W. GO TO HIGH POWER AND FEED 1000Hz TO TRANSMITTER TO GET 90% MODULATION. REDUCE POWER OUTPUT AND NOTE THAT MODULATION PERCENTAGE TRACKS WITHIN + 0.5 dB. IF NOT, RESET AUDIO TRACK A1R124 SLIGHTLY AND REPEAT PROCEDURE UNTIL POWER TRACKING IS OBTAINED. ADJUST AUDIO TRACKING IN LOW POWER AND RESET AUDIO INPUT LEVEL AS NECESSARY IN HIGH POWER. IF THE LF DIST CONTROL IS TOO FAR OFF, IT MAY HAVE TO BE ADJUSTED BEFORE SATISFACTORY AUDIO TRACKING CAN BE ACHIEVED.

6.4.2 CARRIER SHIFT:

IN HIGH POWER OPERATION, APPLY A 400 Hz TONE AT 95% MODULATION. NOTE CARRIER SHIFT WITH APPLICATION OF TONE. ADJUST A1R130 CAR REG FOR EXACTLY 0% CARRIER SHIFT AT 95% MODULATION.

6.4.3 LF DIST:

ADJUST THE LF DIST (A1R121) FOR MINIMUM AUDIO DISTORTION WITH 95% MODULATION IN HP AT 100 Hz. THIS SETTING CAN BE COMPROMISED LATER AT ANOTHER AUDIO FREQUENCY TO ACHIEVE THE BEST AF DISTORTION OVER THE AUDIO RANGE.

6.4.4 AF CLAMP ADJ:

FEED A 1 kHz TRIANGLE WAVEFORM AT 3 dB ABOVE 100% MODULATION TO TRANSMITTER WITH IPL SWITCH OFF. TRANSMITTER WILL OVERMODULATE SEVERELY ON NEGATIVE PEAK AND MAY RING ON THE POSITIVE PEAK. ADJUST CLAMP A1R142 CCW TO APPROXIMATELY 130% POSITIVE MODULATION. THIS SHOULD BE VERIFIED BY OSCILLOSCOPE OBSERVATION. THE HV MUST BE 8500 V TO ACHIEVE 130%. SELECT TAPS ON THE HV XFMR AS REQUIRED TO GET THE NECESSARY HV.

6.4.5 AF CLIPPER ADJUSTMENTS:

SET IPL SWITCH A1S10 TO ON POSITION.

APPLY 1 kHz TONE AT ONE dB ABOVE 100% MODULATION. NEGATIVE PEAK LIGHT WILL BE ON. ADJUST A1R100 NEG LIMIT FOR 95% NEGATIVE MODULATION. BE ABSOLUTELY CERTAIN THAT CARRIER LEVEL METER ON MONITOR IS AT ZERO DEVIATION FOR THIS ADJUSTMENT.

INCREASE SIGNAL LEVEL BY TWO MORE dB (THREE dB ABOVE 100% NEGATIVE MODULATION.) ADJUST A1R105 POS LIMIT TO CLIP AT 125% POSITIVE MODULATION.

THESE SETTINGS ARE APPROXIMATE. FINAL SETTINGS SHOULD BE MADE JUST PRIOR TO COMMENCING THE BURN IN TEST. WITH PROGRAM MODULATION SET THE NEGATIVE LIMITER TO GET -95% MODULATION, BUT NOT -100%. SET THE POSITIVE LIMITER TO GET +120% MODULATION, BUT NOT +125%.

6.5 RF POWER METER AND VSWR OVERLOAD:

WITH THE "NORM/REV" SWITCH S8 IN THE NORMAL POSITION (LEFT) OPERATE THE TRANSMITTER INTO THE DUMMY LOAD AT THE SPECIFIED HP CARRIER LEVEL. SWITCH THE RF POWER METER TO THE "REFLECTED" POSITION AND ADJUST BALANCE CONTROL C44 FOR A MINIMUM READING. REDUCE THE POWER OUTPUT TO 100 WATTS. CHANGE THE "NORM/REV" SWITCH TO THE REVERSE POSITION.

SWITCH THE RF POWER METER TO THE "REFLECTED" POSITION AND ADJUST THE "REF CAL" CONTROL A5R4 TO INDICATE 10% ON THE METER (12% IS FULL SCALE). ON THE CONTROL CIRCUIT MODULE SET THE "VSWR OVERLOAD ADJUST" TO JUST TRIP THE VSWR OVERLOAD AT THE 100 W LEVEL WITH 95% MODULATION AT 1000 HZ. RETURN THE "NORM/REV" SWITCH TO THE "NORMAL" POSITION AND SET THE POWER OUTPUT TO THE SPECIFIED HP LEVEL. PUT THE RF POWER METER IN THE "FORWARD" POSITION AND ADJUST THE "FWD CAL" CONTROL A5R3 TO INDICATE THE 100% ON THE RF POWER METER.

7.0 PERFORMANCE TESTS:

THE FOLLOWING TESTS ARE TO BE PERFORMED ON A TRANSMITTER THAT HAS BEEN ADJUSTED IN ACCORDANCE WITH PARAGRAPHS 4.0, 5.0, AND 6.0 OF THIS SPECIFICATION:

7.1 RF POWER OUTPUT:

OPERATE THE TRANSMITTER AT HP INTO THE DUMMY LOAD WITH NO MODULATION. THE POWER OUTPUT SHALL BE NOT LESS THAN 1.1 kW. THEN SET HP TO THE POWER LEVEL SPECIFIED BY THE SALES ORDER. OPERATE THE TRANSMITTER AT LP INTO THE DUMMY LOAD WITH NO MODULATION. THE POWER OUTPUT SHALL BE AS SPECIFIED BY THE SALES ORDER.

RECORD BOTH THE PLATE VOLTAGE AND PLATE CURRENT REQUIRED TO ACHIEVE THE RATED POWER IN BOTH HIGH AND LOW POWER OPERATIONS.

CALCULATE THE PA EFFICIENCY AT THE HIGH POWER LEVEL SPECIFIED ON THE SALES ORDER.

$$\%\ \text{EFFICIENCY} = \frac{(IRF)2\ (RDL)}{(E_{BB})\ (I_B)} \times 100$$

7.2 CARRIER SHIFT AND MODULATION CAPABILITY:

MEASURE THE CARRIER SHIFT AS INDICATED ON THE AM MODULATION MONITOR AT 95% MODULATION LEVELS OF 400 Hz IN BOTH HP AND LP OPERATION.

MODULATE THE HP CARRIER AT 1 kHz TO VERIFY THE 125% MODULATION CAPABILITY (IPL MUST BE IN THE "OFF" POSITION).

7.3 AF RESPONSE AND DISTORTION:

MEASURE THE ADUIO FREQUENCY INPUT LEVEL IN dB AND THE PERCENT TOTAL HARMONIC DISTORTION AT 95% AND 50% MODULATION OVER THE AUDIO FREQUENCY RANGE OF 20 Hz TO 10,000 Hz.

MEASURE AT THE HIGH POWER LEVEL AND AT THE LOW POWER LEVEL SPECIFIED IN THE SALES ORDER.

USE THE BELAR AMM-1 MODULATION MONITOR AND MEASURE THE INPUT LEVEL IN dB REQUIRED TO MAINTAIN A CONSTANT NEGATIVE MODULATION LEVEL.

MEASURE THE NOISE LEVEL REFERENCED TO 95% MODULATION AT 400 Hz IN BOTH HP AND LP.

IPL MUST BE IN THE "OFF" POSITION DURING THESE TESTS.

7.4 BURN IN:

OPERATE THE TRANSMITTER AT 1.1 kW INTO THE DUMMY LOAD WITH PROGRAM MODULATION FOR A PERIOD OF 16 TO 24 HOURS.

AT THE SUCCESSFUL COMPLETION OF THE BURN IN, RECORD THE TOTAL TIME OF THE HEAT RUN AND A COMPLETE SET OF METER READINGS FOR CUSTOMER HP OUTPUT MODULATED 95% AT 1 kHz, HP CARRIER, LP OUTPUT MODULATED 95% AT 1 kHz, LP CARRIER, AND WITH FILAMENTS ON ONLY.

ALSO RECORD THE RF OUTPUT FREQUENCY READ BY THE FREQUENCY COUNTER.

REAR DOOR WITH FLUSHING FAN OPERATING MUST BE CLOSED DURING BURN IN.

THE FINAL SETTINGS FOR THE NEGATIVE AND POSITIVE LIMITERS IN THE IPL CIRCUIT SHOULD BE SET WITH PROGRAM MODULATION AT THE BEGINNING OF THE BURN IN AS FOLLOWS:

WITH THE IPL SWITCH OFF, SET THE INCOMING PROGRAM AUDIO LEVEL TO JUST BARELY LIGHT THE +125% INDICATOR ON THE MOD MONITOR. TURN THE IPL SWITCH ON. SET THE NEGATIVE LIMITER TO LIGHT THE -95% INDICATOR BUT NOT THE -100% INDICATOR. SET THE POSITIVE LIMITER TO LIGHT THE +120% INDICATOR BUT NOT THE +125% INDICATOR.

STATION _____
FREQUENCY 1140 KHz

UNIT S/N 116
DATE _____
TECHNICIAN Brian Heim

8.0 DATA SHEETS:

THE FOLLOWING DATA SHEETS ARE FOR THE ADJUSTMENTS AND TESTS DESCRIBED IN PARAGRAPHS 4.0, 5.0, 6.0 AND 7.0 ABOVE:

314R-1 AM TRANSMITTER, CPN 622-5273-001
MECHANICAL INSPECTION COMPLETE ✓ OK

8.1 INITIAL ADJUSTMENTS (COLD):

| | | |
|---|---|---|
| PLATE TRANSFORMER | T1 | 250 VAC |
| 28V TRANSFORMER | T3 | ✓ (2.0A S/B fuse) |
| RF DRIVER TRANSFORMER | T4 | 250 VAC |
| BIAS TRANSFORMER | T5 | 250 VAC (1.5A S/B fuse) |
| LOGIC PS TRANSFORMER | T6 | ✓ (0.5A S/B fuse) |
| PA FILAMENT TRANSFORMER | T9 | 250 VAC |
| MOD FILAMENT TRANSFORMER | T10 | 250 VAC |

8.1.2 INITIAL POT SETTINGS:

| | | |
|---|---|---|
| NEGATIVE CLIPPER | A1R100 | CW _____ |
| POSITIVE CLIPPER | A1R105 | CW _____ |
| IPL SWITCH | A1S10 | OFF ✓ |
| PA FILAMENT ADJ | R16 | CCW _____ |
| MOD FILAMENT ADJ | R15 | CCW ✓ |

| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV C | SHEET 30 |

074-5225-051

8.1.3 INITIAL WIRING CHECKS:

| | |
|---|---|
| AC POWER WIRING | ✓ OK |
| HIGH VOLTAGE PS WIRING | ✓ OK |
| BIAS POWER SUPPLY | ✓ OK |

8.1.4 OUTPUT NETWORK TUNING:

8.1.4 INSTALLATION OF COMPONENTS:

| | |
|---|---|
| FREQUENCY | 1140 kHz |
| NODE 1 CAP C31 | 180 pF |
| NODE 2 CAP C4 | 2400 pF |
| NODE 2 CAP C5 | 2400 pF |
| NODE 3 CAP C6 | 2400 pF |
| NODE 3 CAP C7 | 2400 pF |

8.1.4.2 APPROXIMATE SETTINGS:

| | |
|---|---|
| PA TUNING AND COILS SET | ✓ OK |

8.1.4.3 FINAL SETTINGS:

| | | |
|---|---|---|
| PA TUNING | C30 | 347.3 OHMS (348) |
| NODE 1 TUNING | L1 | 23 ~~ACTIVE~~ TURNS shorted |
| NODE 1-2 COUPLING | L2 | 20 ~~ACTIVE~~ TURNS above gnd |
| NODE 2 TUNING | L2 | 9.9 ~~ACTIVE~~ TURNS shorted |
| NODE 2-3 COUPLING | L3 | 29.3 ~~ACTIVE~~ TURNS shorted |
| NODE 3 TUNING | L4 | 8.8 ~~ACTIVE~~ TURNS shorted |
| OUTPUT COUPLING | L4 | 4.5 ~~ACTIVE~~ TURNS above ground |

| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 31 |

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8.1.5 ARC GAP SETTING:

| | | |
|---|---|---|
| RF ARC SENSOR GAP SET TO .194 INCHES | ✓ | CHECK |
| A9T1 GAPS SET TO .010 INCHES | ✓ | CHECK |
| FRONT MODULATOR GAP SET TO .155 INCHES | ✓ | CHECK |
| REAR MODULATOR GAP SET TO .194 INCHES | ✓ | CHECK |

8.1.6 PA GRID RESISTOR:

| | | |
|---|---|---|
| R24 SET TO 250 OHMS | 250.8Ω | CHECK ✓ |

8.2 PRELIMINARY ADJUSTMENTS (FIL ON):

| | | |
|---|---|---|
| DUMMY LOAD CONNECTED | ✓ | CHECK |
| DUMMY LOAD INTERLOCKS | ✓ | CHECK |
| AIR SWITCH SET AND ADJUSTED PROPERLY | ✓ | OK |

8.2.1 FILAMENT VOLTAGE: PRECISION METER

| | | |
|---|---|---|
| PA FILAMENT | ✓ V | (4.8±.1V) |
| MOD FILAMENT | ✓ V | (4.8±.1V) |
| FIL REG VOLTAGE | V | |

8.2.2 TEST METER READINGS:

| | | TYPICAL READING |
|---|---|---|
| -12 | -12.1 V | ( 12 V) |
| - 6 | -6.1 V | ( 6 V) |
| + 5 | 5.0 V | ( 5 V) |
| +12 | 12.1 V | ( 12 V) |
| +28 | 30 V | ( 28 V) |
| Ecc | 200 V | (200 V) |
| Ic | 0.8 A | (2.4 A) |
| HV | 9000 V | ( 0 V) |
| FWD | V | ( 0 V) |
| REF | V | ( 0 V) |

| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 32 |

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8.2.3 PLATE CURRENT METER AND HVPS OVERLOAD:

| | |
|---|---|
| PRECISION AMMETER | PLATE CURRENT METER |
| 0.500 | 0.500 (0.500 ± 2%) |
| HVPS O/L SET FOR ~~0.35~~ 0.40 AMPS | ✓ OK |

8.2.4 BIAS POWER SUPPLY:

| | |
|---|---|
| +125 V | +121.16V OK 240VAC tap |
| -125 V | -116.86 OK 240VAC tap |

8.2.5 SWITCH FREQUENCY:

| | |
|---|---|
| SWITCH FREQUENCY | 70.000 kHz (70.0 ± 0.5 kHz) |

8.2.6 RF EXCITER FREQUENCY:

| | |
|---|---|
| OSCILLATOR FREQUENCY | 1140.0001 kHz ($f_o$ ± 1 Hz) |

8.2.7 RF PULSE WIDTH:

| | |
|---|---|
| RF PULSE WIDTH SET TO 120° | ✓ OK |

8.2.8 DC REFERENCE:

| | |
|---|---|
| DC REFERENCE SET TO ~~3V~~ 1.5V | ✓ OK |

8.2.9 RF DRIVER OVERCURRENT:

| | |
|---|---|
| SET CCW FROM TRIP POINT | ✓ OK |

| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 33 |

074-5225-051

8.3 FINAL ADJUSTMENTS:

| | | |
|---|---|---|
| DUMMY LOAD CONNECTED | ✓ | CHECK |
| CARRIER INTERLOCK OK | ✓ | CHECK |
| "FILAMENT OFF" LIGHT OK | ✓ | CHECK |
| "PLATE OFF" LIGHT OK | ✓ | CHECK |
| "FILAMENT ON" LIGHT OK | ✓ | CHECK |
| "HP ON" LIGHT OK | ✓ | CHECK |
| PLATE VOLTAGE | ✓ | CHECK |
| PLATE CURRENT | ✓ | CHECK |
| PLATE TUNING DIP OK | ✓ | CHECK |

8.3.1 PA LOADING:

| | | |
|---|---|---|
| PRECISION VOLTMETER 3.0 kV | | CHECK |
| FRONT PANEL VOLTMETER | | kV (3.0 ± .60V) |
| PULSE WIDTH SET | 120° | OK (120° ± 10°) |
| PLATE CURRENT | | AMPS (0.500±0.025) |

8.3.2 LOW POWER AND MOD MONITOR:

| | | |
|---|---|---|
| LOW POWER | ____ PLATE VOLTS | ____ WATTS |
| MOD MONITOR SET TO 30 Vpp (HP & LP)±5V | | ____ OK |

8.3.3 OVERLOAD RECYCLE:

| | | |
|---|---|---|
| RECYCLE OK | ✓ | CHECK |
| 1 SECOND OVERLOAD OK | ✓ | CHECK |
| SINGLE OVERLOAD OK | ✓ | CHECK |
| DUMMY LOAD INTERLOCK | ✓ | CHECK |

8.3.4 AUDIO AND CLIPPING LEVELS:

AUDIO TRACKING SET _____ dB (± 0.5)

CARRIER SHIFT SET _____ % (0)

LF DISTORTION SET _____ OK

AF CLAMP SET _____ % (+130)

NEGATIVE CLIPPER SET _____ % (- 95)

POSITIVE CLIPPER SET _____ % (+120)

8.3.5 RF POWER METER AND VSWR OVERLOAD:

BALANCE _____ OK

REFLECTED POWER CALIBRATE (F.S.=12%) _____ OK (100W=10%)

REFLECTED OVERLOAD AT 95% MOD _____ OK (10 ± 1)

FORWARD POWER CALIBRATE 100% = _____ kW (1000)

RF AMMETER _____ AMPS

LOAD = _____ OHMS

| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 35 |

074-5225-051

8.4 FREQUENCY TESTS:

8.4.1 RF POWER OUTPUT:

HP RF OUTPUT $E_{BB}$ _____ kV $I_B$ _____ A _____ kW (1000W)

$E_{BB}$ _____ kV $I_B$ _____ A _____ kW (CUSTOMER HP)

PA EFFICIENCY _____ % = $\frac{\text{WATTS}}{(E_{BB})(I_B)}$ X 100

LP RF OUTPUT $E_{BB}$ _____ kV $I_B$ _____ A _____ WATTS (CUSTOMER LP)

8.4.2 CARRIER SHIFT AND MODULATION CAPABILITY:

| % MODULATION | HP | LP |
|---|---|---|
| 95 | _____ (NMT 2%) | _____ |

+125% MODULATION _____ OK

| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 36 |

074-5225-051

8.4.3 AF RESPONSE AND DISTORTION:

HIGH POWER

| FREQ Hz | 95% LEVEL-dBm | 95% THD-% | 50% LEVEL-dBm | 50% THD-% |
|---|---|---|---|---|
| 20 | | | | |
| 50 | | | | |
| 100 | | | | |
| 400 | | | | |
| 1K (REF) | | | | |
| 3K | | | | |
| 5K | | | | |
| 7.5K | | | | |
| 10K | | | | |
| | (NMT±1dB) | (NMT 2%) | | |

NOISE LEVEL _____ dB
(NLT 55)

LOW POWER

| | | | | |
|---|---|---|---|---|
| 20 | | | | |
| 50 | | | | |
| 100 | | | | |
| 400 | | | | |
| 1K (REF) | | | | |
| 3K | | | | |
| 5K | | | | |
| 7.5K | | | | |
| 10K | | | | |

NOISE _____ dB

| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 37 |

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8.4.4 BURN IN:

TIME _____ HRS

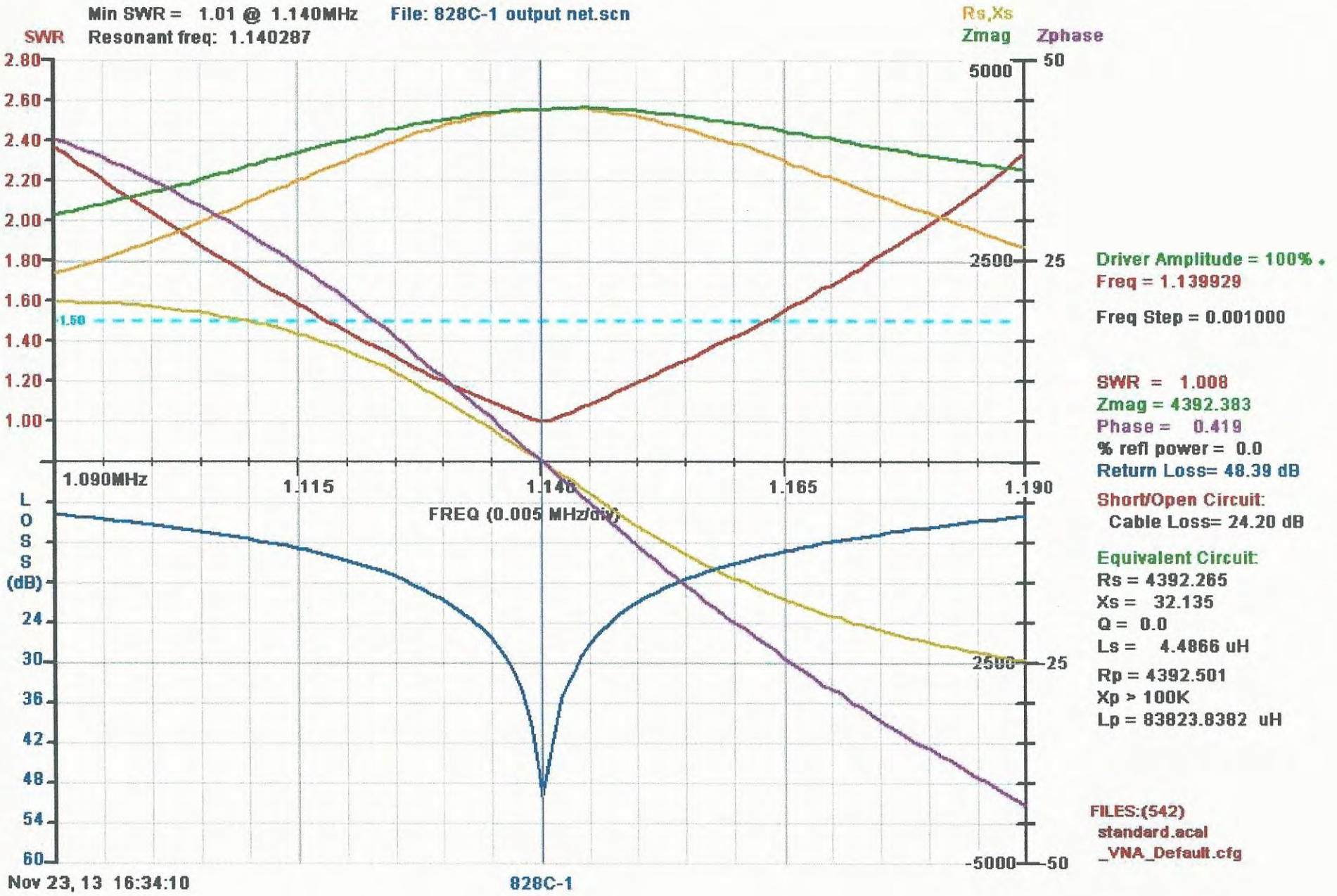
FREQUENCY _____ kHz ($f_o \pm$ Hz)

IPL SET WITH PROGRAM _____ OK

| METER | FIL ON | CARRIER | | 95% MOD | |
|---|---|---|---|---|---|
| | | HP | LP | HP | LP |
| -12 - V | | | | | |
| - 6 - V | | | | | |
| + 5 - V | | | | | |
| +12 - V | | | | | |
| +28 - V | | | | | |
| Ecc - V | | | | | |
| Ic - A | | | | | |
| HV - kV | | | | | |
| EBB - kV | | | | | |
| IB - A | | | | | |
| PF - % | | | | | |
| PR - % | | | | | |
| IRF - A | | | | | |

| SIZE | CODE IDENT NO. | DWG NO. |
|---|---|---|
| A | 52151 | 669-8887-001 |
| SCALE | REV A | SHEET 38 |

074-5225-051



FO 5172

# FACTORY TEST DATA

TYPE 314R-1 SERIAL NO. 330 DATE 9-18-81

RADIO STATION WSCP FREQUENCY 1140 KHz LOAD IMPEDANCE 50 ohms

MEASURED PERFORMANCE DATA @ 1.0 / .25 kW

## PERCENT HARMONIC DISTORTION

| FREQUENCY (Hz) | 25% MOD. | | 50% MOD. | | 85% MOD. | | 95% MOD. | |
|---|---|---|---|---|---|---|---|---|
| | LOW | HIGH | LOW | HIGH | LOW | HIGH | LOW | HIGH |
| 20 | 0.7 | 0.5 | 0.9 | 0.6 | 1.2 | 0.8 | 1.2 | 0.9 |
| 50 | 0.7 | 0.4 | 1.1 | 0.5 | 1.3 | 0.8 | 1.5 | 0.9 |
| 100 | 0.8 | 0.5 | 1.0 | 0.5 | 1.4 | 0.8 | 1.6 | 0.9 |
| 400 | 0.9 | 0.6 | 1.0 | 0.5 | 1.3 | 1.0 | 1.5 | 1.0 |
| 1,000 | 1.1 | 0.7 | 1.1 | 0.6 | 1.6 | 0.8 | 1.9 | 0.9 |
| 5,000 | 1.6 | 0.6 | 1.9 | 0.5 | 2.4 | 1.4 | 2.2 | 1.4 |
| 7,500 | 1.6 | 0.7 | 1.8 | 0.6 | 2.1 | 1.8 | 2.2 | 1.9 |
| 10,000 | 1.5 | 0.8 | 1.4 | 1.0 | 2.7 | 0.9 | 2.8 | 1.1 |

FREQUENCY RESPONSE @ 70% MOD., HIGH POWER

| FREQUENCY (Hz) | LEVEL (dBm) |
|---|---|
| 20 | -0.2 |
| 50 | -0.2 |
| 100 | 0 |
| 400 | 0 |
| 1,000 | 0 REF. |
| 3,000 | -0.2 |
| 5,000 | -0.7 |
| 7,500 | -0.8 |
| 10,000 | -1.0 |

AUDIO INPUT FOR 100% MODULATION (1,000 Hz) +10 dBm

CARRIER SHIFT 0 %

NOISE LEVEL BELOW 100% MOD. -58 dB

FACTORY TEST DATA

TYPE 314 R-1 SERIAL NO. 330 DATE 9-18-81

TRANSMITTER METER READINGS

| TEST METER | |
|---|---|
| - 6 VOLT | -6 |
| -12 VOLT | -12.5 |
| +12 VOLT | +12.5 |
| + 5 VOLT | +5 |
| +28 VOLT | +28 |
| DR $E_C$ | 204 |
| DR $I_C$ | 0.7 |

| | CARRIER | | 95% MOD. | |
|---|---|---|---|---|
| | LP | HP | LP | HP |
| HV | 8.75 KV | 8.25 KV | 8.5 KV | 8.0 KV |
| FWD PWR | 100 % | 30 % | 32 % | 105 % |
| REF PWR | 0 | 0.25 % | 0.1 % | 0.4 % |
| PLATE VOLTAGE | 1.45 KV | 2.9 KV | 1.5 KV | 2.95 KV |
| PLATE CURRENT | .24 A | .47 A | .24 A | .47 A |
| RF LINE CURRENT | 2.23 A | 4.47 A | | |
| POWER OUTPUT | .25 KW | 1.0 KW | | |
| LINE VOLTAGE | 208 | 208 | | |

FACTORY TEST DATA

TYPE 314R-1 SERIAL NO. 330 DATE 9-18-81

OUTPUT NETWORK TUNING DATA

| | | | |
|---|---|---|---|
| C4, C5, C6, C7 | TYPE 291 | 912-4140-160 | 2400 pF. |
| C31 | TYPE 292 | 912-4126-090 | 180 pF |
| C30 TURNS (CCW FROM STOP) | | | 8.75 |
| L1 TYPE 980-0048-000 | NO. TURNS SHORTED | | 23.0 (23.0) |
| L2 TYPE 980-0133-000 | NO. TURNS SHORTED | | 9.7 (9.9) |
| STRAP 2 (TURNS ABOVE GROUND) | | | 1.8 (2.0) |
| L3 TYPE 980-0047-000 | NO. TURNS SHORTED | | 27.2 (29.3) |
| L4 TYPE 980-0132-000 | NO. TURNS SHORTED | | 8.5 (8.9) |
| STRAP 6 (TURNS ABOVE GROUND) | | | 4.75 (4.5) |

FACTORY TEST DATA

TYPE 314R-1 SERIAL NUMBER 330 DATE 9-18-81

ADDITIONS, CHANGES AND DELETIONS

A1 C81 Changed from 1500 pf to 1000 pf

FO 5294

# FACTORY TEST DATA

TYPE 314R-1 SERIAL NO. 344 DATE 7-23-82

RADIO STATION WDGL FREQUENCY 1520 KH zLOAD IMPEDANCE 50Ω

MEASURED PERFORMANCE DATA @ 1 / .5 kW

## PERCENT HARMONIC DISTORTION

| FREQUENCY (Hz) | 25% MOD. | | 50% MOD. | | 85% MOD. | | 95% MOD. | |
|---|---|---|---|---|---|---|---|---|
| | LOW | HIGH | LOW | HIGH | LOW | HIGH | LOW | HIGH |
| 20 | .6 | .5 | .8 | .9 | .8 | .8 | .7 | .6 |
| 50 | .7 | .4 | .7 | .9 | .6 | .6 | .6 | .5 |
| 100 | .7 | .4 | .7 | .9 | .5 | .6 | .5 | .4 |
| 400 | .6 | .4 | .7 | .8 | .5 | .6 | .5 | .5 |
| 1,000 | .7 | .6 | .8 | .8 | .6 | .8 | .8 | .7 |
| 5,000 | .8 | .8 | 1.0 | .9 | 1.9 | 1.7 | 1.8 | 1.7 |
| 7,500 | .7 | .8 | 1.1 | 1.0 | 1.9 | 1.9 | 2.0 | 1.9 |
| 10,000 | .8 | .9 | 1.2 | 1.0 | 2.1 | 2.0 | 2.3 | 2.0 |

FREQUENCY RESPONSE @ 70% MOD., HIGH POWER

| FREQUENCY (Hz) | LEVEL (dBm) |
|---|---|
| 20 | 0 |
| 50 | 0 |
| 100 | 0 |
| 400 | 0 |
| 1,000 | 0 REF. |
| 3,000 | -.4 |
| 5,000 | -.8 |
| 7,500 | -.9 |
| 10,000 | -1.0 |

AUDIO INPUT FOR 100% MODULATION (1,000 Hz) +10 dBm

CARRIER SHIFT 0 %

NOISE LEVEL BELOW 100% MOD. -61 dB

TESTED BY: Anthony Peterson

# FACTORY TEST DATA

TYPE 314 R-1 SERIAL NO. 344 DATE 7-23-82

## TRANSMITTER METER READINGS

| TEST METER | |
|---|---|
| - 6 VOLT | -6V |
| -12 VOLT | -12V |
| +12 VOLT | +12V |
| + 5 VOLT | +5V |
| +28 VOLT | +28V |
| DR $E_C$ | 200V |
| DR $I_C$ | .7A |

| | CARRIER | | 95% MOD. | |
|---|---|---|---|---|
| | LP | HP | LP | HP |
| HV | 8.3KV | 8KV | 8.4KV | 8.1KV |
| FWD PWR | 48% | 100% | 55% | 102% |
| REF PWR | .2% | .5% | .5% | .7% |
| PLATE VOLTAGE | 2100V | 2950V | 2150V | 3000V |
| PLATE CURRENT | .34A | .48A | .35A | .485A |
| RF LINE CURRENT | 3.1A | 4.47 | | |
| POWER OUTPUT | 500W | 1KW | | |
| LINE VOLTAGE | 208 | 208 | | |

FACTORY TEST DATA

TYPE 314R-1 SERIAL NO. 344 DATE 7-23-82

OUTPUT NETWORK TUNING DATA

| | | |
|---|---|---|
| C4, C5, C6, C7 | TYPE 291 | 1600 pF |
| C31 | TYPE 292 | NOT USED pF |
| C30 TURNS (CCW FROM STOP) | | 13 |
| L1 TYPE 980-0048-000 | NO. TURNS SHORTED | 27.5 |
| L2 TYPE 980-0133-000 | NO. TURNS SHORTED | 10.7 |
| STRAP 2 (TURNS ABOVE GROUND) | | 1.5 |
| L3 TYPE 980-0047-000 | NO. TURNS SHORTED | 29.7 |
| L4 TYPE 980-0132-000 | NO. TURNS SHORTED | 9.2 |
| STRAP 6 (TURNS ABOVE GROUND) | | 4.0 |

FACTORY TEST DATA

TYPE 314R-1 SERIAL NUMBER 344 DATE 7-23-82

ADDITIONS, CHANGES AND DELETIONS

# 314R-1 HV POWER SUPPLY MODIFICATION

## PURPOSE

There have been some instances where an arc in the High Voltage Power Supply or at Arc Gaps has resulted in loss of transistors on the Switch Mod card and loss of components in the Bias Power Supply. Because of the large amount of stored energy in the filter capacitor, a tremendous amount of current will flow in the high voltage wiring when there is a short circuit or an arc from the High Voltage lines to ground. This high current can induce damaging voltage into other circuits. In this modification, a 50 ohm resistor is installed at the output of the filter capacitor which will limit to peak discharge current to less than 200 amps in the event of an arc or short circuit on the HV power supply.

An additional 150 ohm resistor is installed between the rectifier output and filter capacitor making a total of 300 ohms at this point. The purpose of this change is to limit the primary current during a H.V. short circuit or arc and thus preventing the H.V. Breaker from tripping off.

The original Overload circuit provided minimal overload protection for the HV power supply since the HV Breaker was intended to serve the purpose. A high voltage overload circuit is provided by this modification that will disconnect the primary power to the H.V. transformer when the power supply current exceeds approximately_____amps. This overload circuit does not recycle and requires that the operator turn the Plate on again after an overload.

One of the Interlock switches, S2, is removed. All 1-1/2 inch steatite insulators are replaced with MIL standard insulators. The grounding interlock circuit on the

-125 VDC bias is removed. High Voltage wiring is routed to prevent coupling into low voltage circuits and lead lengths are reduced.

PARTS REQUIRED

1 ea. Modification Kit P/N_____

TOOLS REQUIRED

Common hand tools such as screwdrivers, nutdrivers, etc. will be required. In addition, drills and taps for #6-32 and #10-32 holes into the steel side panels will be necessary.

TIME REQUIRED

6 hours

SAFETY PRECAUTIONS

BEFORE WORKING INSIDE THE TRANSMITTER, THE PRIMARY POWER MUST BE REMOVED BY OPERATING THE WALL DISCONNECT SWITCH. DO NO DEPEND ON TRANSMITTER SWITCHES OR CIRCUIT BREAKERS FOR POWER REMOVAL. USE GROUNDING STICK TO DISCHARGE ALL POWER SUPPLY CAPACITORS. GROUND THE PRIMARY CONNECTIONS ON PLATE AND SCREEN TRANSFORMERS TO ASSURE THAT PRIMARY POWER HAS BEEN REMOVED. DO NOT WORK ALONE.

PROCEDURE

(1) Disconnect AC power from transmitter. Remove four screws securing Bias Supply A6 to HV insulators and set A6 on Top of HV transformer T1. Remove six screws securing front bottom access panel and then remove panel, disconnect cable clamps if necessary.

(2) Locate HV cover panel located behind hinged control panel - bears warning sign. Disconnect four interlock wires from the terminal block. Remove four screws and nuts holding panel in place, then remove panel.

(3) Remove the following wires; cut ti-wraps as needed (LE9 Designates High Voltage Wire)

| | | | | | |
|---|---|---|---|---|---|
| (A) | Black wire | from | Z6-1 | to | E6(Gnd) |
| (B) | White/Green wire | from | Z6-2 | to | R3-1(Refer to Fig.2) |
| (C) | LE9 wire | from | R6-2 | to | C1-2 Insert) |
| (D) | LE9 | from | A4-E2 | to | C1-2 |
| (E) | LE9 | from | CR5-Cathode | to | C1-1 |
| (F) | LE9 | from | R6-2 | to | C1-2 |
| (G) | LE9 | from | A6TB1-3(Bias Supply) | to | S3-2 |
| (H) | LE9 | from | A6TB1-5 | to | S2-1 |
| (I) | LE9 | from | S2-1 | to | S3-1 |
| (J) | LE9 | from | S2-2 | to | S3-2 |
| (K) | LE9 | from | S2-2 | to | C1-2 |
| (L) | LE9 | from | XA2-1,2,3 | to | S7-1 |
| (M) | LE9 | from | S7-1 | to | A6TB1-5 |
| (N) | LE9 | from | CR-6 Cathode | to | R3-1(Refer to Fig.2 Insert) |

(4) Remove S2, High Voltage interlock switch. This switch is located at the front of the transmitter near the floor on the right side. This switch is unnessary since the lower front panel can not be removed without access thru the rear of the transmitter.

(5) Splice the two wires together that were connected to the Micro Switch on S2. One of these wires will be red and the other will be white/orange or white/green.

(6) Replace both 1-1/2" interlock switch ceramic insulators on S3 with Mil. Spec. 1-1/2" insulators provided in kit. Original insulators had no lettering or identification on them. The replacement insulators have letters and numbers on them. S3 is located at back of transmitter on low left side.

(7) Remove switch-modulator card A2 if not done so already in step 3. Remove four screws securing XA2 socket to insulators. Place LE9 wire (K) thru rear of Modulator compartment and solder one end to XA2-1,2,3 (Switch Mod receptacle). This wire replaces wire removed in step 3(L) and will be connected to Bias Supply.

(8) Replace the four 1-1/2" ceramic insulators which support XA2 socket with new Mil. Spec. 1-1/2" insulator provided. Mount XA2 connector to new insulators.

(9) Disconnect primary and secondary leads from modulator filament transformer T10. Remove four screws securing T10 to chassis and remove T10 from transmitter being careful no to drop transformer. Replace the two 1-1/2" ceramic insulators supporting R23 with new 2" ceramic insulators supplied in kit.

(10) Remove the ceramic post which supports the left end of switch modulator card A2 and replace with red_____" insulator post.

(11) Locate the four holes to be drilled as shown in Fig. 1 . Mark and drill with #_____bit. Tap hole with #6-32 tap. Depending upon Drill Motor size, blower may have to be removed or right angle drill used in this step.

(12) Mount two terminal post's in the horizontal holes just tapped. Mount 68 ohm/2W resistor as shown in Fig. 2 . Use the resistor lead as bus wire from E9A to E9B. Solder resistor in place.

(13) Using two #6 screws, mount new relay K6 as shown in Fig. 2 . Route wires as shown using ti-wraps to secure new wires to existing cable. Cut wires to length and connect as shown:

| | | | | |
|---|---|---|---|---|
| (A) | Grey (small) | to | 68 ohm, R23 | (Solder Connection) |
| (B) | Red | to | E7 | (Solder Connection) |
| (C) | Grey (large) | to | A1A terminal 8 | (Screw Terminal) |
| (D) | Orange | to | A1TB1 terminal 5 | (Spade Lug) |
| (E) | White/Red/Green | to | W/R/G wire removed from A1A-8 | (Splice) |

NOTE: The existing white/red/green wire at A1A-8 terminal is removed from A1A-8 and spliced to new white/red/green wire. New grey (large) wire now goes to A1A-8.

(14) Add HV wire from Z6-1 to mounting screw as shown Fig. 2 .

(15) Reinstall modulator filament transformer and reconnect primary/secondary terminals.

(16) Locate, mark, and drill the four holes on left side panel using #_____bit. See Fig. 3. Tap these holes using 10-32 tap. Mount a 2" insulator in each of these holes using 10-32 stud and cork washer. Then mount a clamp on each insulator using 10-32 screw and cork washer. Install the 50 ohm resistor as R10 and the 150 ohm resistor as R6.2.

(17) Add the following LE9 (High Voltage wires) as shown on Fig. 4 and Fig._____. These wires are not to be run parallel nor tied to any low voltage wiring bundle.

| | | | | |
|---|---|---|---|---|
| (A) LE9 wire | from | R6.1-2 | to | R6.2-1 |
| (B) LE9 | from | CR5-C | to | R10-2 |
| (C) LE9 | from | R10-2 | to | C1-1 |
| (D) LE9 | from | A4-E2 | to | R6.2-2 |
| (E) LE9 | from | R6.2-2 | to | C1-2 |
| (F) LE9 | from | C1-2 | to | S3-2 |
| (G) LE9 | from | A6TB1-3 | to | S3-2 |
| (H) LE9 | from | A4E3 | to | CR21-C |
| (I) LE9 | from | Z6-2 | to | R10-1 |
| (J) LE9 | from | Z6-2 | to | R3-1(Refer to Fig. 2 Insert) |
| (K) LE9 | from | XA2-1,2,3 | to | A6TB1-5 |
| (L) LE9 | from | C1-1 | to | S3-1 |

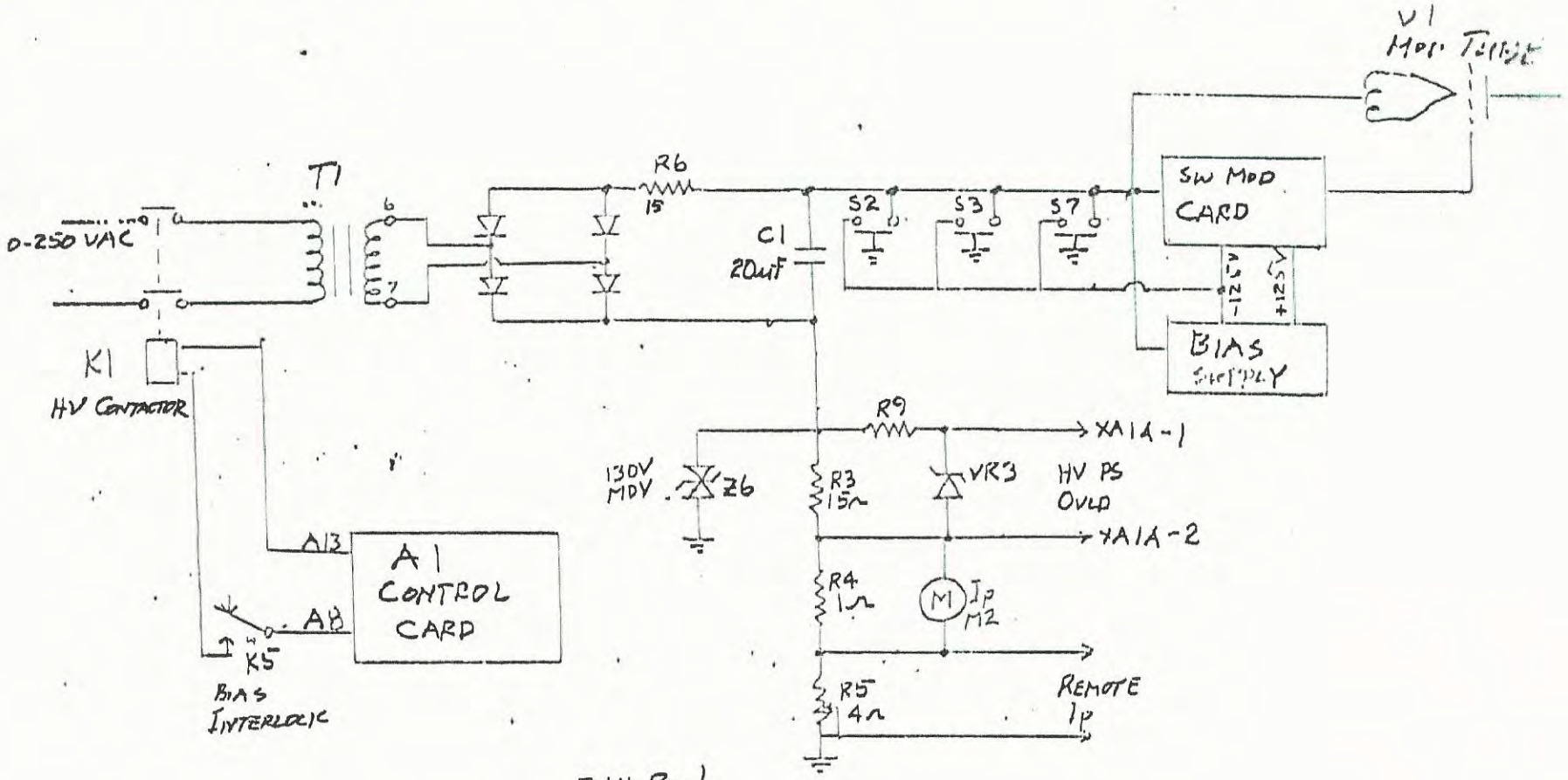
(18) These two wires may be moved and shortened if so desired. Refer to Fig._____ for location and placement.

| | | | | | |
|---|---|---|---|---|---|
| (A) | LE9 | from | C2 | to | A4-E1 |
| (B) | LE9 | from | E19B | to | T10-5 |

(19) Use ti-wraps to secure loose cables and dress up as needed.

(20) Remove all scraps and debris from transmitter and clean. Replace HV cover panel removed in step 2 and reconnect interlock wires on terminal block. Remount front bottom cover then remount A6 Bias Supply to HV insulators.

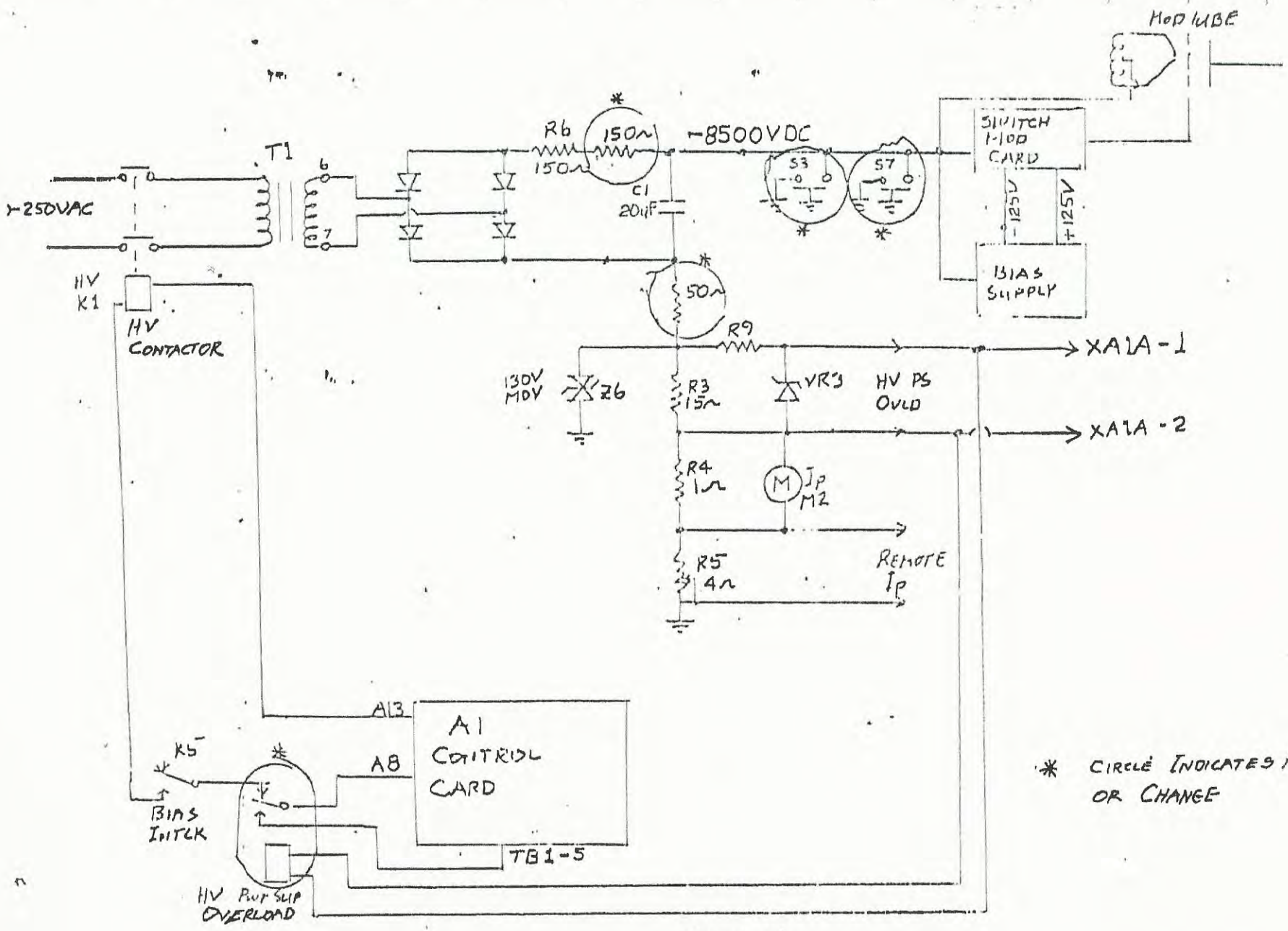
(21) Reconnect AC power to transmitter. Turn transmitter on and check for normal operation.




314R-1

HV POWER SUPPLY

ORIGINAL WIRING

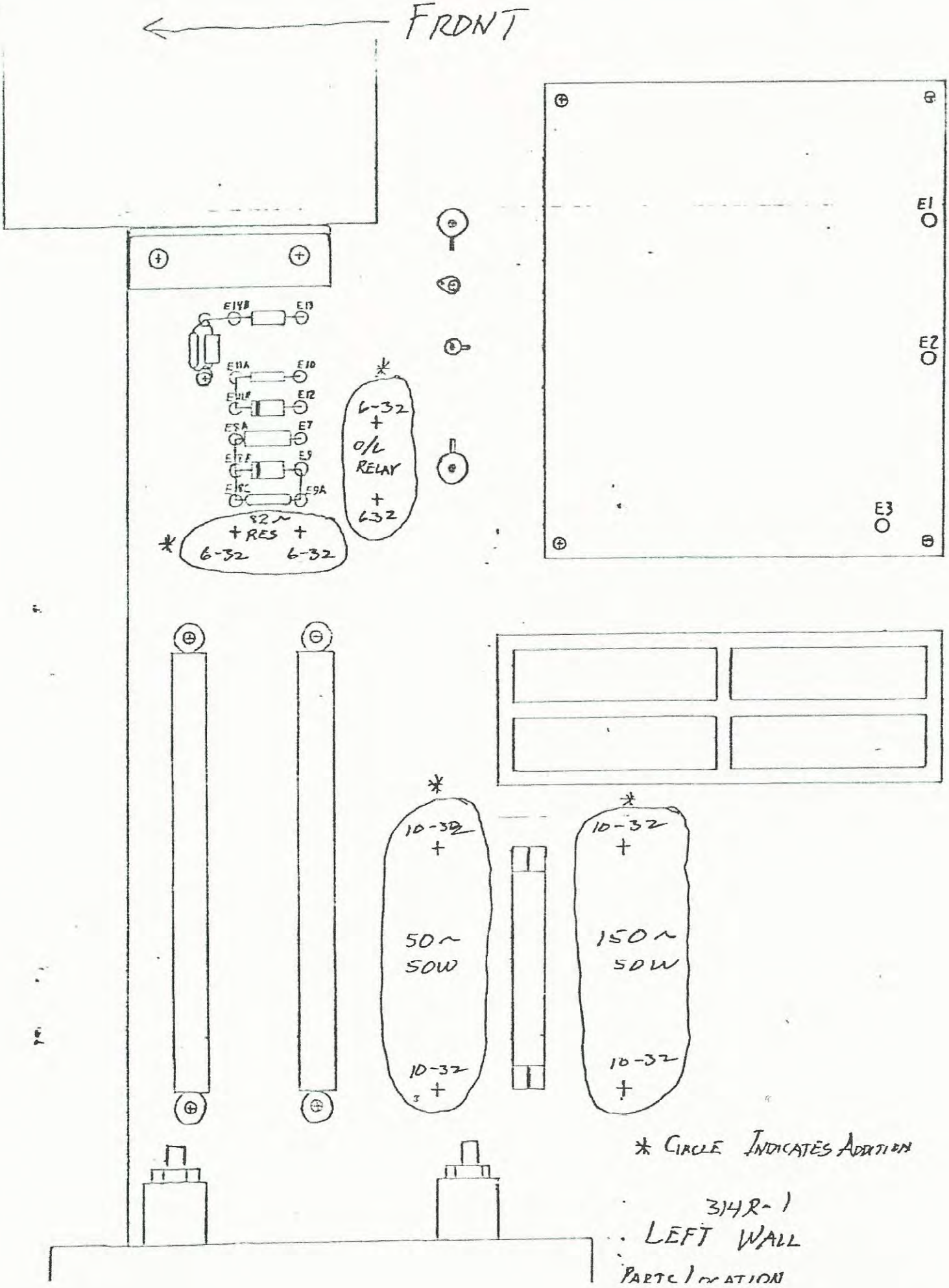



* CIRCLE INDICATES ADDITION OR CHANGE

314R-1

HV POWER SUPPLY

MODIFIED WIRING

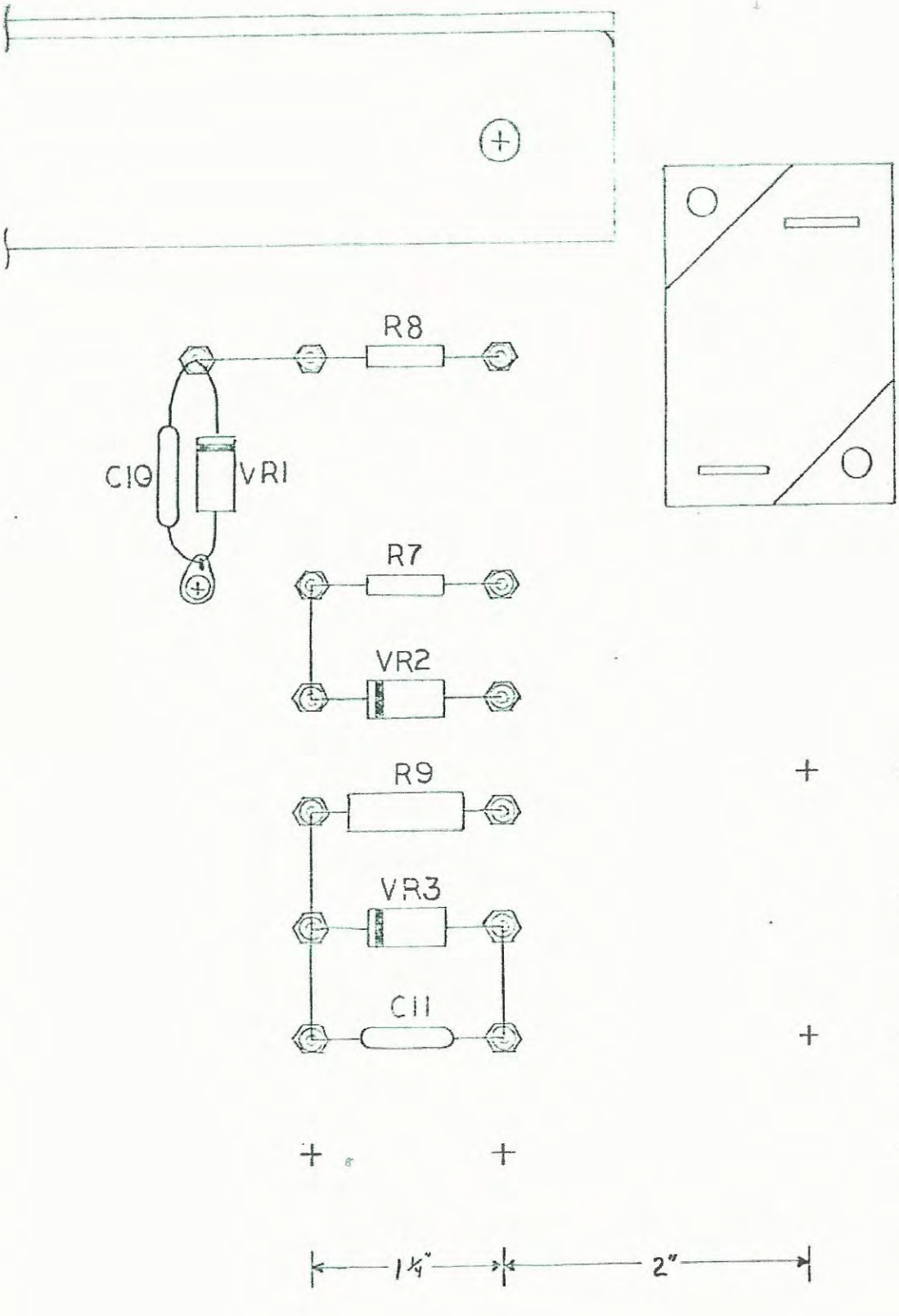



* CIRCLE INDICATES ADDITION

314R-1

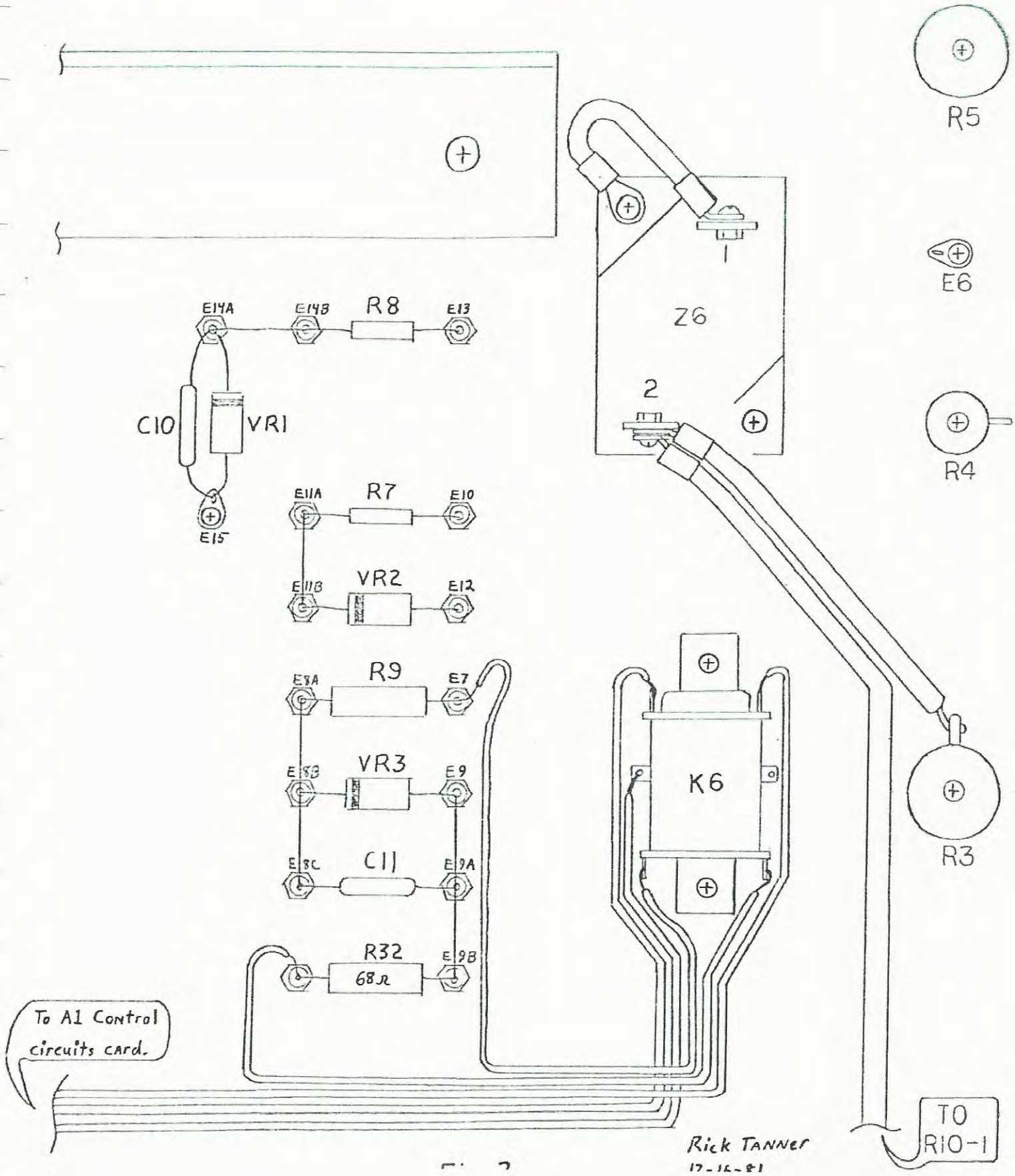
LEFT WALL

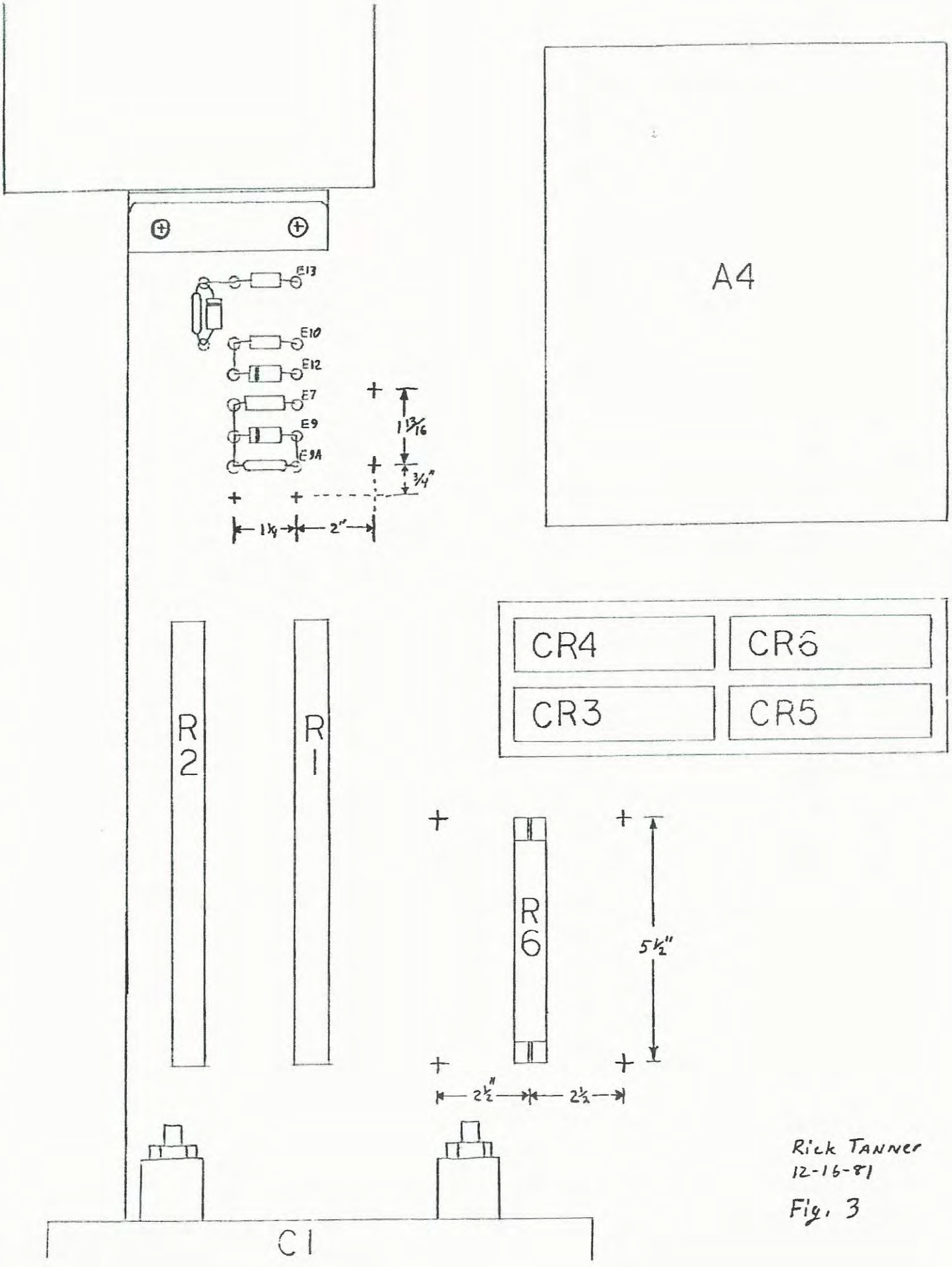
PARTICIPATION




Rick Tanner
12-16-81

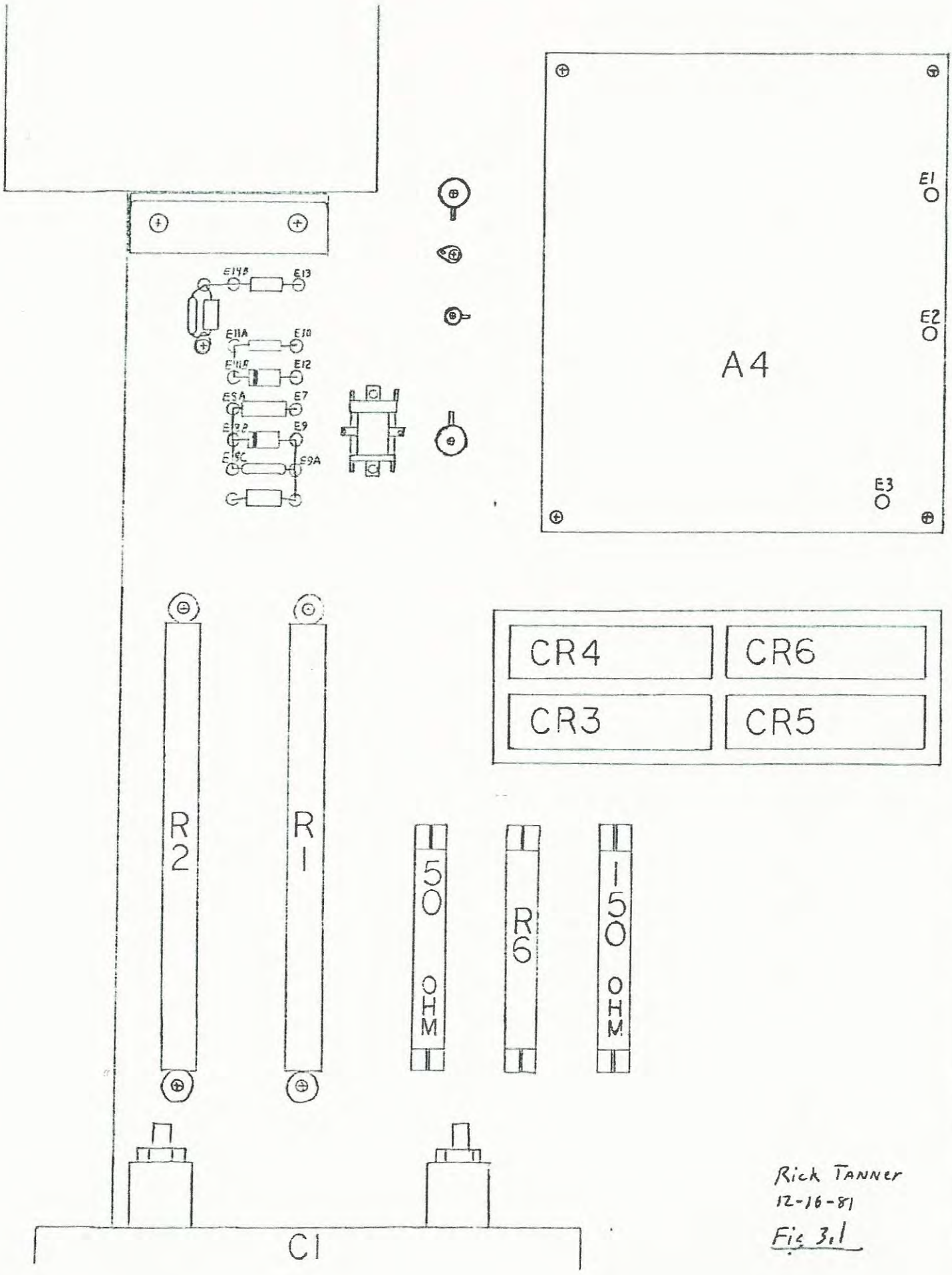
Fig. 1





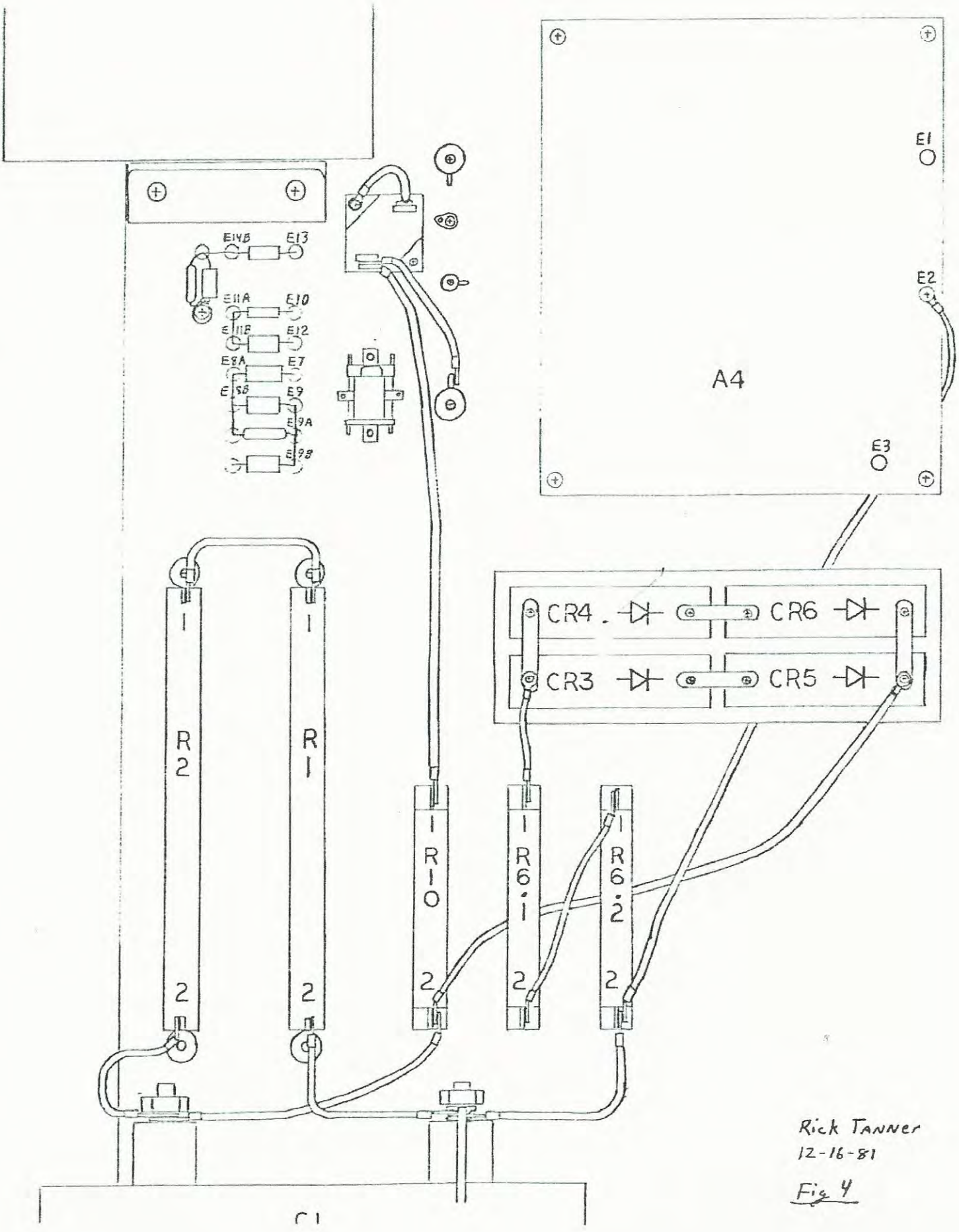

Rick Tanner
12-16-81

Fig. 3




Rick Tanner
12-16-81

Fig 3.1




Rick Tanner
12-16-81

Fig 4

**PRODUCT IMPROVEMENT BULLETIN**
**314R-1 RF DRIVER**
April 10, 1987
E-xxx-87-JFR

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**INTRODUCTION:**

A simple modification to the 314R-1 RF Driver Module can substantially improve the performance of the RF Driver's Protection Circuitry. RF Current is now returned from the RF Transformer to Q2's Emitter through chassis ground and Capacitor C29. Moving the transformer return connection directly to Q2's Emitter allows the removal of C29 which increases the speed of the Driver Protection Circuitry.

Two additional protection diodes are connected between the bases and emitters of Q1 and Q2. They prevent reverse biasing of the transistors in any fault mode. You will need two 1N5418 Diodes for this modification. They are available from the Service Parts Department of Continental Electronics under Part Number 353-9009-440.

**WARNING**

**High Voltage** is used in this equipment.

**High Voltage** can cause severe injury or death.

**INSURE** that all circuit breakers are **OFF** and primary power is **DISABLED** at the wall disconnect. **DISCHARGE** all power supplies.

**PROCEDURE**

Remove the RF Driver Assembly from the transmitter. First, disconnect the RF Transformer Leads and the multi-pin MOLEX Plug. Carefully remove the retaining screws and lift the module from the transmitter.

Loosen the nut retaining the Black Banana-Plug Jack. Add the insulating sleeve provided with these instructions and retighten the nut to form an insulated jack assembly similar to the adjacent red jack. Next, locate and remove Capacitor C29, a yellow-colored, 1 uF, 200 V Capacitor. (C29 is located diagonally from the fuseholder.) Use a short piece of insulated wire to connect the now-insulated Black Banana-Plug to the stand off connected to Q2's Emitter. Run the wire through the same hole through which the wire connecting the red-colored Banana Plug is routed.

Next, add a 1N5418 Diode between the base and emitter terminals of each transistor socket, connecting the anode to the emitter and the cathode to the base terminal as shown in the attached schematic. The base terminal on each socket has a 15 Ohm, 1 Watt Resistor connected to it.

Reinstall the RF Driver Assembly, correctly mating the colored jacks and Molex Plug. Carefully inspect the transmitter and return it to normal operation. This completes the modification.

Contact the Continental Electronics Field Service Department at 214-327-4533 if you have any questions concerning this modification.

1N5418 diode : CEC P/N 353-9009-440

Continental Electronics Corporation

# 314R-1/828C-1 3-500Z TUBE PROBLEM

Some brands of 3-500Z tubes will run very hot in the Modulator position but will operate properly in the RF position. It is normal for the Modulator tube anode to appear red when operating at full power without modulation and can be expected to be yellow with full modulation. However, it should never appear white hot with or without modulation.

The output pulse from the Switching Modulator Card has a fixed rise time going in the positive direction. If this rise time is too slow for the particular modulator tube used, there will be excessive anode dissipation. If the rise time is too fast, you cannot achieve 100% modulation in the negative direction. It appears that some of the tubes that are available now, have different characteristics from those that were available when the transmitter was designed and this rise time must be changed in order to use these tubes in the Modulator position.

Continental has checked two commonly available brands of 3-500Z tube in a 314R-1 and recommends the following changes to the Switching Modulator Card, A2 circuits:

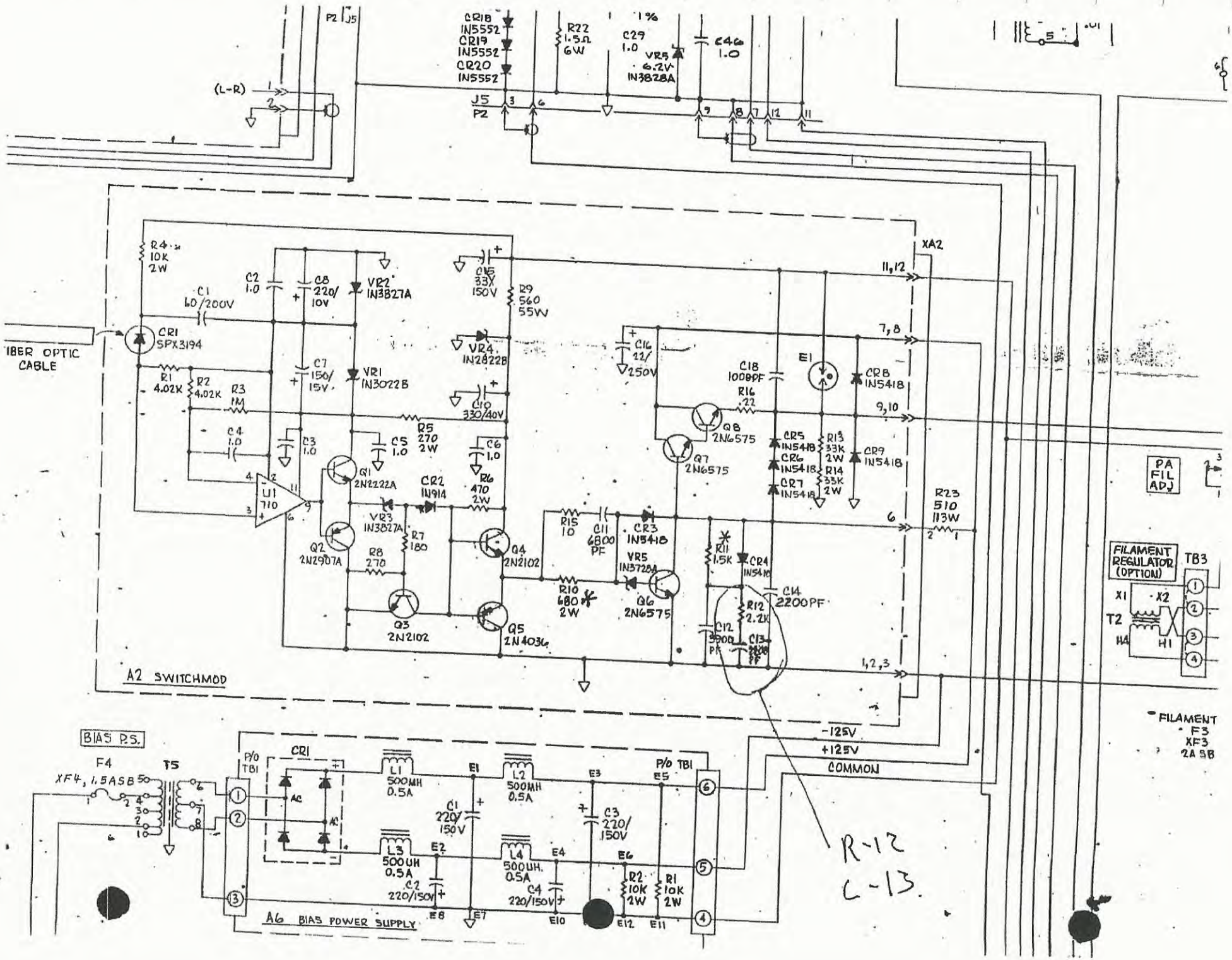
1. Change R-12 to 2.7K, 2Watt Carbon Composition, Continental P/N RCR42G272JS.
2. Change C-13 to 1200pf, 500Volt, plastic coated silver mica, Continental P/N CM06FD122JO3.
3. Verify value of R-10. May be two parallel 1500 ohm, 2 Watt Carbon composition. Continental P/N RCR42G152JS.
4. Verify value of R-11. Should be 3.9K if Q6 is IRF-330 or 1.5K if Q6 ns 2N6575.

**NOTE: It is important that only Non-Inductive, Carbon Composition resistors be used at R-10, R-11, and R-12.**

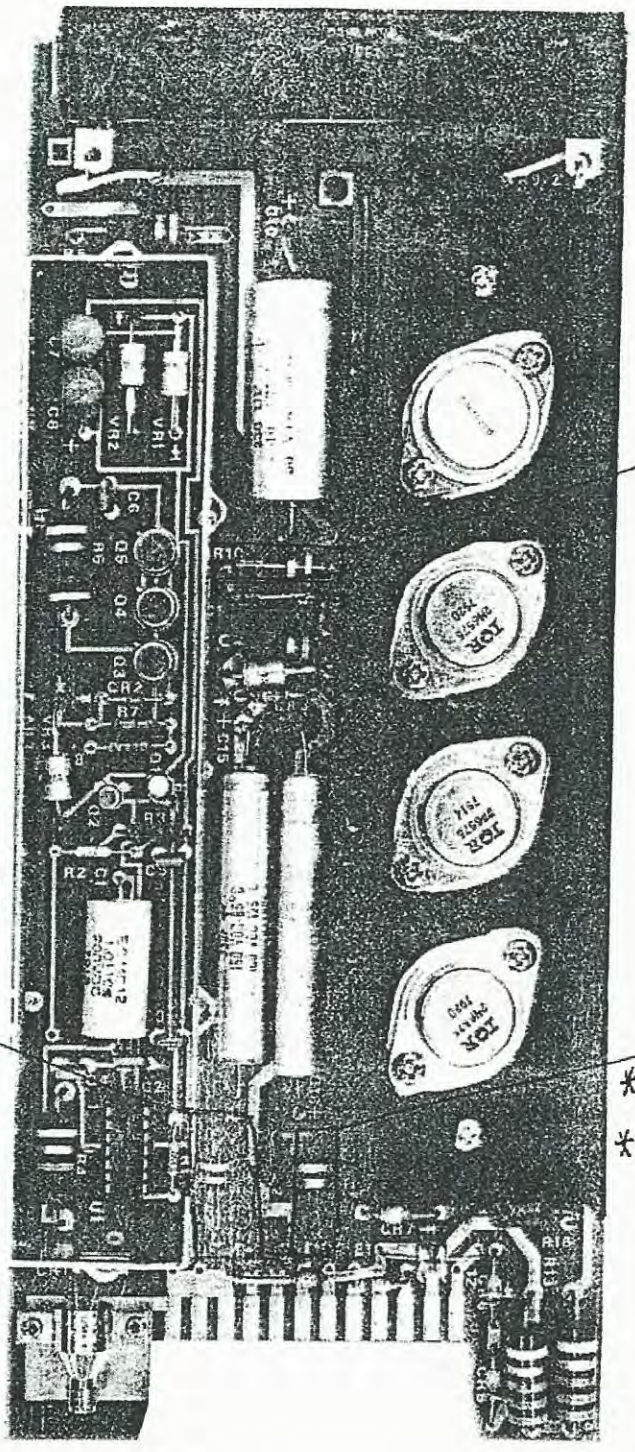
5. Add a Parasitic Suppressor in series with Modulator anode lead, Continental P/N 650-2969-001.

Please contact Continental Field Service at (214)388-5800 if you have comments or questions about these changes. We would appreciate any comments about your experience with any brand of tube that you may be using in this transmitter and your results. Since this transmitter is out of production, we must depend on your input to us to help provide useful information to all users.

4212 S. Buckner Blvd., Dallas, TX 75227, Phone: (214) 381-7161, Fax: (214) 381-5424, http://ww.contelec.com



parts list



R-10
680 Ω @ 2W
OR
2 ea. 1.2K @ 2W
IN PARALELL

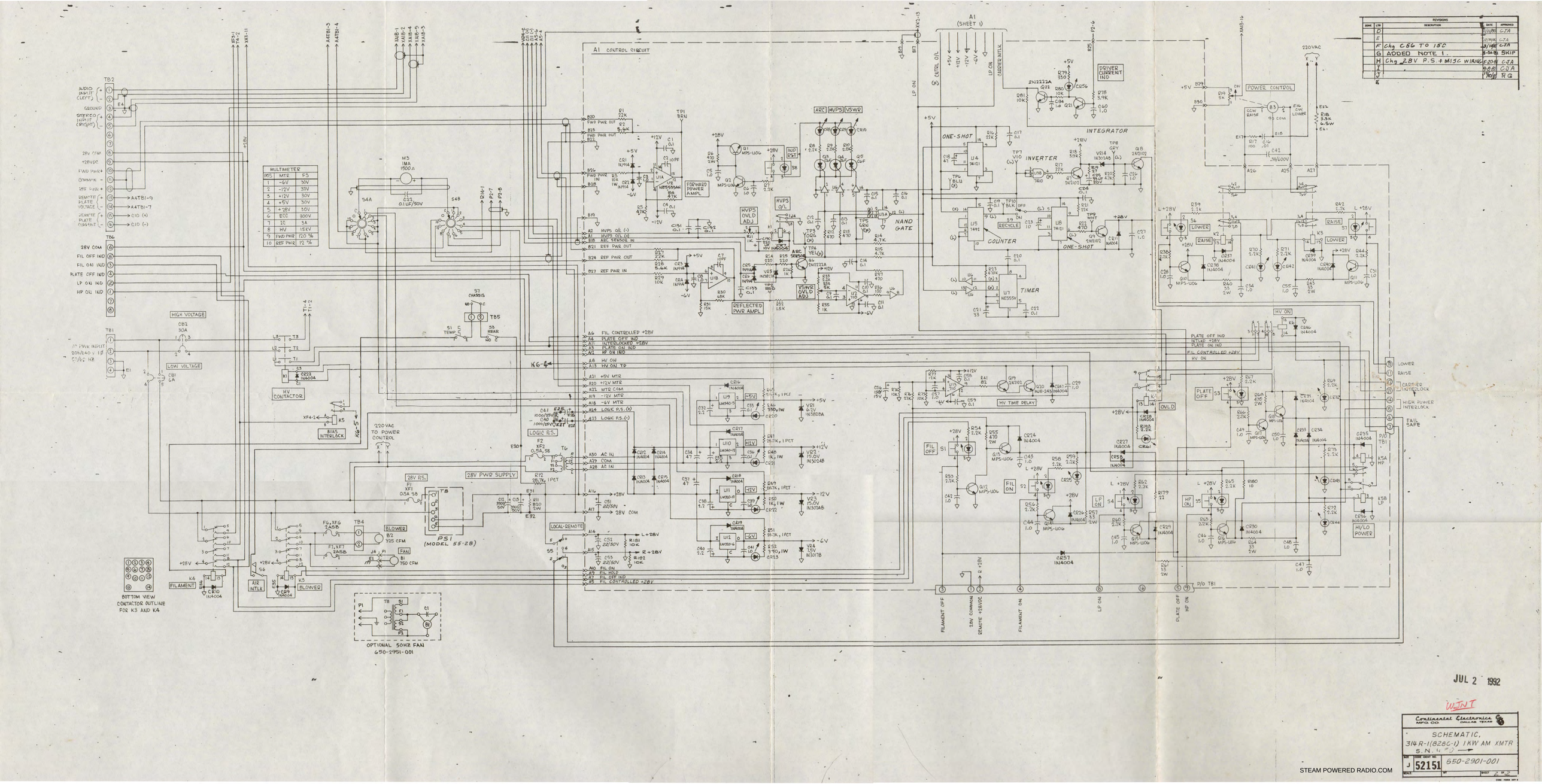
R-12
C-13

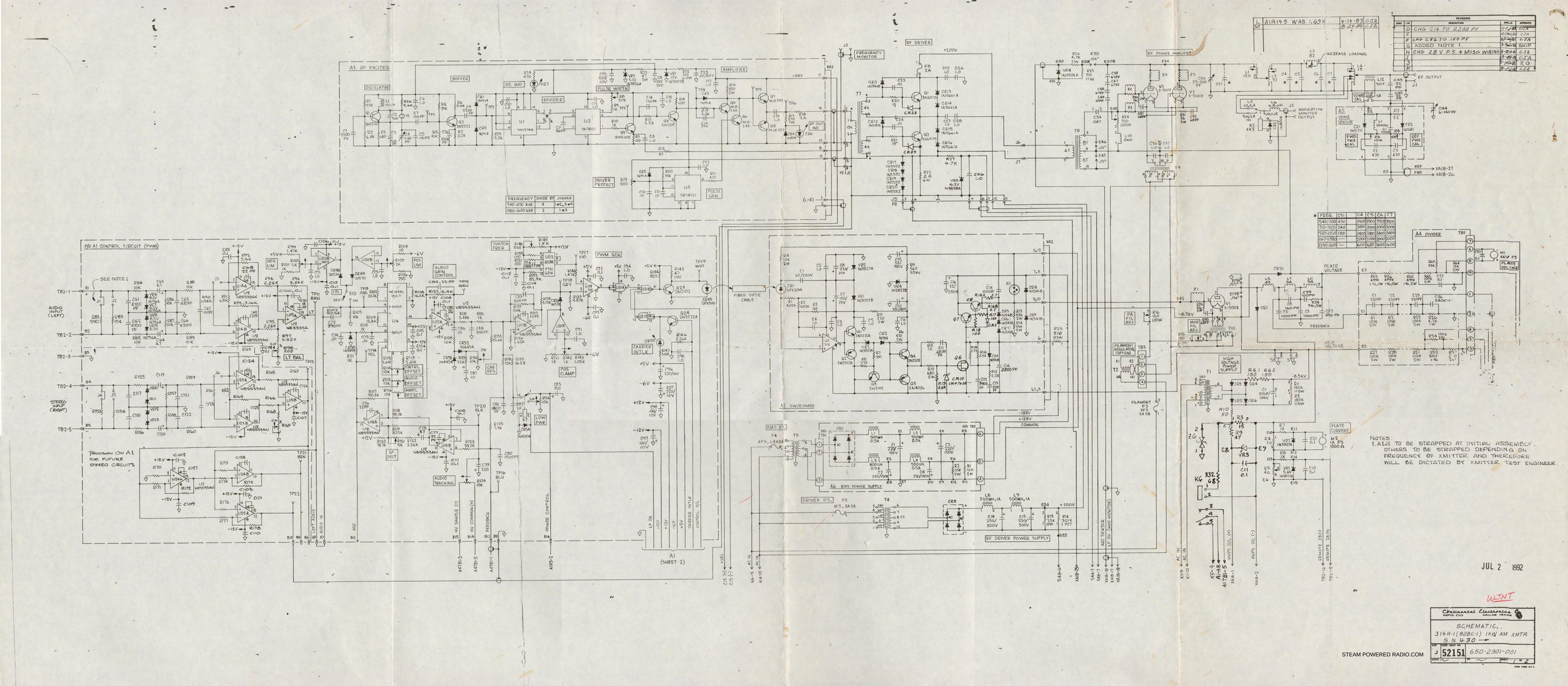
R-11*
*1.5K IF Q6 IS 2N6575
*3.9K IF Q6 IS IRF330

R-12 CHANGE TO 2.7K @ 2W

C-13 CHANGE TO 1200 PF. @ 500V

Fig. 7-5. Switchmod Card (A2)


A1 CONTROL CIRCUIT
A1 (SHEET 1)
TB2
TB6
TB1
TB5
MULTIMETER
| POS | MTR | F-S |
| --- | --- | --- |
| 1 | -6V | 30V |
| 2 | -12V | 30V |
| 3 | +12V | 30V |
| 4 | +5V | 30V |
| 5 | +28V | 30V |
| 6 | ECC | 300V |
| 7 | IC | 3A |
| 8 | HV | 15KV |
| 9 | FWD PWR | 120 % |
| 10 | REF PWR | 12 % |
FORWARD POWER AMPL
REFLECTED PWR AMPL
NAND GATE
ONE-SHOT
INTEGRATOR
INVERTER
COUNTER
TIMER
RECYCLE
HV TIME DELAY
POWER CONTROL
DRIVER CURRENT IND
220VAC
HIGH VOLTAGE
LOW VOLTAGE
HV CONTACTOR
BIAS INTERLOCK
220 VAC TO POWER CONTROL
28V PWR SUPPLY
LOGIC PS.
28V PS.
PSI (MODEL 55-28)
BLOWER
FAN
AIR INTLK
BLOWED
FILAMENT
LOCAL-REMOTE
OPTIONAL 50HZ FAN 450-2951-001
BOTTOM VIEW CONTACTOR OUTLINE FOR K3 AND K4
FIL OFF
FIL ON
LP ON
HP ON
OVLD
PLATE OFF
HV/LO POWER
FAIL SAFE
LOWER
RAISE
CARRIER INTERLOCK
HIGH POWER INTERLOCK
P/O TB1
FILAMENT OFF
28V COMMON
REMOTE +28VDC
FILAMENT ON
LP ON
PLATE OFF
HP ON
HV ON
PLATE OFF IND
INTLKD +28V
PLATE ON IND
FIL CONTROLLED +28V
HV ON
A1 CONTROL CIRCUIT
A6 FIL CONTROLLED +28V
A4 PLATE OFF IND
A11 INTERLOCKED +28V
A5 PLATE ON IND
A2 HP ON IND
A8 HV ON
A13 HV ON TP
A21 +5V MTR
A10 +12V MTR
A22 MTR COM
A19 -12V MTR
A18 -6V MTR
A24 LOGIC PS.(+)
A23 LOGIC PS.(-)
A30 AC IN
A29 COM
A28 AC IN
A16 +28V
A17 28V COM
A14 L+28V
A15 R+28V
A10 FIL ON
A9 FIL HOLD
A7 FIL OFF IND
A5 FIL CONTROLLED +28V
B20 FWD PWR OUT
B23 FWD PWR OUT
B24 FWD PWR IN
B25
B19
A2 HVPS O/L (-)
A1 HVPS O/L (+)
B18 ARC SENSOR IN
B21 REF PWR OUT
B24 REF PWR OUT
B27 REF PWR IN
HVPS O/L
HVPS OVLD ADJ
VSWR OVLD ADJ
ARC
HVPS
VSWR
REVISIONS
| ZONE | LTR | DESCRIPTION | DATE | APPROVED |
| --- | --- | --- | --- | --- |
| | D | | 11/1/80 | CJA |
| | E | | 12/19/80 | CJA |
| | F | Chg C56 TO 15C | 3/1/82 | CJA |
| | G | ADDED NOTE 1. | 5-26-82 | SKIP |
| | H | Chg +28V P.S. + M13C WIRING | 5-20-86 | CJA |
| | I | | 9-8-88 | CJA |
| | J | | 7-10-90 | RG |
JUL 2 1992
WJNT
Continental Electronics MFG. CO. DALLAS TEXAS
SCHEMATIC, 314R-1(828C-1) 1KW AM XMTR
S.N. 1 & UP
SIZE J 52151 CODE IDENT NO. 650-2901-001
SCALE WT SHEET 2 OF 2
STEAM POWERED RADIO.COM




NOTES
1. A1J1 TO BE STRAPPED AT INITIAL ASSEMBLY. OTHERS TO BE STRAPPED DEPENDING ON FREQUENCY OF XMITTER AND THEREFORE WILL BE DICTATED BY XMITTER TEST ENGINEER.