

INSTRUCTIONS  
CS9100  
10x10 INTERCOM SYSTEM



INDEX

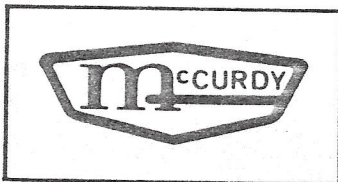
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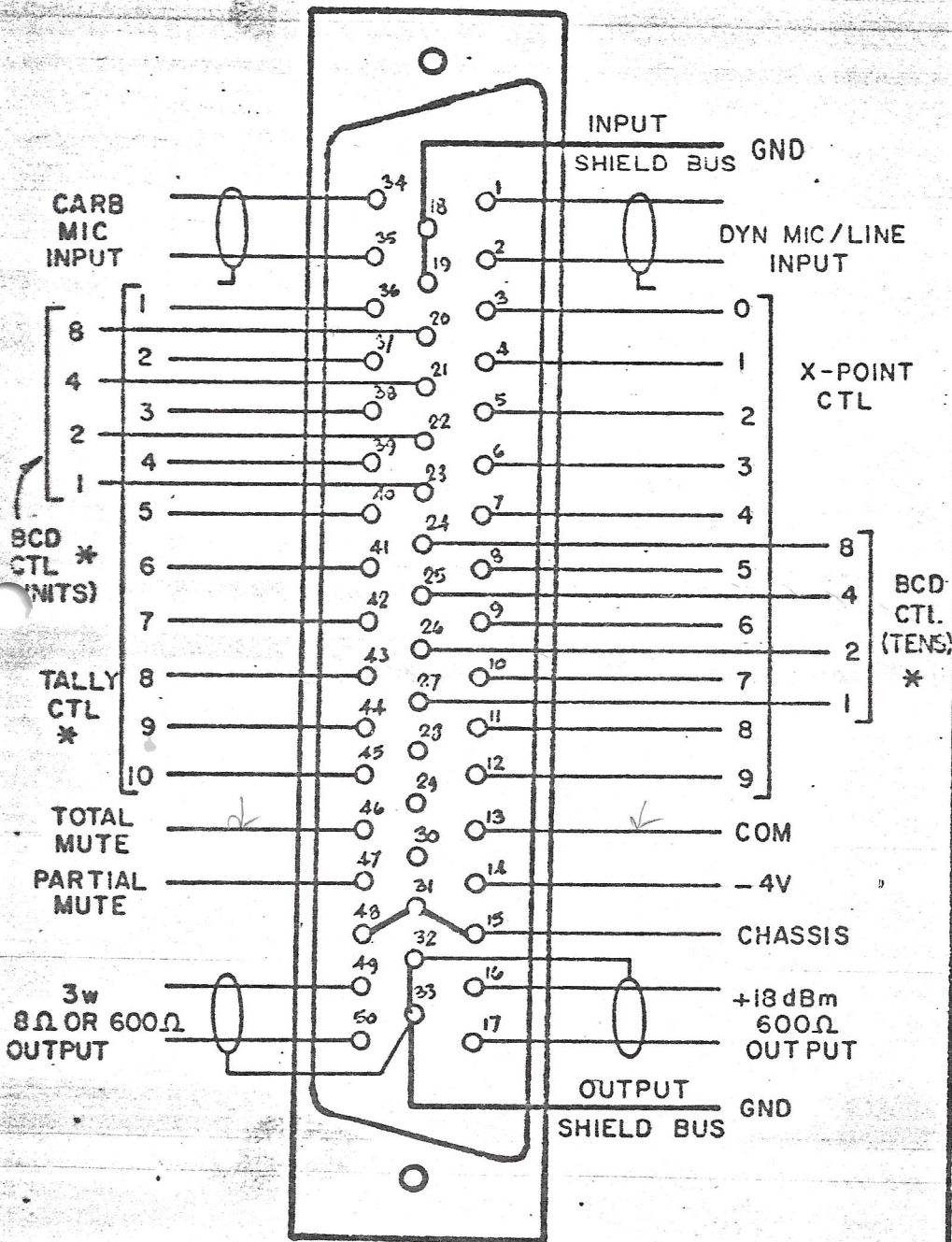
**McCURDY RADIO INDUSTRIES LIMITED**

108 CARNFORTH ROAD, TORONTO, ONTARIO M4A 2L4  
(416) 751-6262, TELEX 06-963533, TWX 610-492-1373

**McCURDY RADIO INDUSTRIES INC.**

1711 CARMEN DRIVE, ELK GROVE VILLAGE, ILLINOIS 60007,  
(312) 640-7077, TWX 910-222-0436

TYPICAL REAR PANEL  
CONNECTOR



WIRING SIDE

\* INDICATES  
OPTIONAL  
WIRING.

MCQUAY-NORRIS INDUSTRIES LIMITED  
TORONTO - ONTARIO

CS 9100

10x10 INTERCOM

TYPICAL REAR PANEL  
CONNECTOR WIRING LAYOUT

DRAWING NO.

A-9100/8-1

UNIT-

APPROVED-

DRAWN-

DECIMAL ± .008

FRACTIONAL ± 1/64

ANGULAR ± 1/2°

TOLERANCES UNLESS  
OTHERWISE SPECIFIED

MATERIAL-

50 PIN AMP. OR CANNON  
CHASSIS-MOUNT CONNECTOR

FINISH-

SCALE-

SC

CHECKED-

DATE-

30 JUNE 77

CA

DESIGN-

ALL DIMENSIONS IN INCHES  
DO NOT SCALE

<u>Figure</u>	<u>SYSTEM DRAWINGS</u> <u>Title</u>	<u>Number</u>
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SUB ASSEMBLY INSTRUCTIONS

AP276

Preamplifier

AM478T

Output Amplifier

RT613

Relay Timer

PS852

Power Supply

CS9000-5

Voltage Regulator

Section 1 GENERAL DESCRIPTION

- 1.01 The CS9100 is a complete 10 input, 10 output (10 x 10) intercom system with the reliability and flexibility to fill the majority of requirements for professional use.
- 1.02 All switching is done by solid state crosspoints with balanced inputs and outputs.
- 1.03 The intercom system includes ten input amplifier and matrix modules, five dual output amplifiers, and a power supply mounted in a single 19 inch equipment frame.
- 1.04 All inputs, outputs and controls are connected to the intercom system via 50-pin subminiature 'D' connectors mounted on the rear of the equipment frame.
- 1.05 Key panels, microphones and speakers can be supplied, as extra-cost options, by McCurdy Radio Industries to complete the system.

Preamplifier

- 1.06 The preamplifier and a 1 x 10 switching matrix are mounted on a common printed circuit board. See AP176, AP276, AP376, AP476 manual for a detailed description.
- 1.07 The preamplifier incorporates an AGC amplifier, which may be switched in or out by means of a plug-in jumper on the PC board.
- 1.08 Three inputs, carbon microphone, dynamic microphone and line, are provided. These can be selected by means of a rotary switch mounted directly on the PC board.
- 1.09 The preamplifier output is routed to the edge connector before being fed to the matrix section to allow for the insertion of auxiliary equipment (jackfields, etc.).

Switching Matrix

- 1.10 The switching matrix determines the audio routing from the input to the desired output, as shown on the Audio Functional Diagram, Figure 7-2.
- 1.11 Each printed circuit board contains a 1 x 10 (one input to ten output) switching matrix along with the input and AGC amplifiers.
- 1.12 At each crosspoint of the matrix, where communication is desired, a solid-state integrated circuit switch is installed. The switch is activated by the application of a -4V DC control voltage, via a key panel, to the proper control pin (or pins).

- 1.13 The crosspoints may be controlled by one of two methods:
- (a) Discrete control, where the control voltage is applied to one pin which activates the desired crosspoint, ten wires for ten crosspoints.
  - (b) BCD (Binary Coded Decimal) control, where the control voltage is applied, in BCD code, to the control pins. A BCD to decimal decoder, on the circuit board, then activates the desired crosspoint. Four control wires can control up to ten crosspoints.
- 1.14 Isolation in the switching matrix is maintained by means of the isolating resistors and a virtual ground summing amplifier. The FET switches, which are on when the crosspoint is not activated, maintain back-loading on the isolation resistors.

### Output Amplifiers

- 1.15 Several output amplifier configurations are available. Some types having a 0 dBm and +18 dBm line output only, and others having a 3W, 8 ohm output in addition to the line output. In addition, some types have output transformers, providing isolated 8 ohm and 150 or 600 ohm outputs, while other types do not. See AM178, AM278, AM378, AM378T, AM379, AM478, AM478T, AM479 manual for a detailed description.
- 1.16 All output amplifiers incorporate a summing amplifier input and 0 dBm and +18 dBm outputs whose levels are independent of the front panel gain control setting.
- 1.17 All output amplifiers with a three watt output stage incorporate a solid-state FET switching circuit for muting. By grounding the proper control pin (or connecting to -4V DC) the output may be totally muted or reduced in level by 15 dB (adjustable 0 dB to approximately 30 dB).
- 1.18 The three watt output stage, on amplifiers so equipped, is fully protected against overloads or short circuits.

### Power Supply

- 1.19 One PS852 or PS852A power supply provides  $\pm 15$  volts DC at 2A, which is sufficient to operate all amplifiers and switching circuits in the intercom.
- 1.20 In order to reduce the turn-on current surge, power is fed to output amplifiers AM7 through AM10 via a delay circuit. This circuit delays the application of power to these output amplifiers for a few seconds, giving the rest of the intercom system time to stabilize.
- 1.21 Where the PS852 is used, the RT613 delay circuit is used. The PS852A has this circuit built-in.
- 1.22 The  $\pm 15$  volt DC supply is reduced to  $\pm 4$  volts DC by a CS9000-4 sub-regulator. This voltage is used to operate the switching and control circuits.

Options

- 1.23 External Circuit Drivers  
The external circuit drivers, when wired, provide an electronic switch, for the control of lamps or relays, which closes to ground when the crosspoint is activated. One electronic switch, consisting of an open collector transistor shunted by a diode, is provided per crosspoint. See AP176 - AP476, XP177 - XP477 instructions for full specifications.
- 1.24 BCD (Binary Coded Decimal) Crosspoint Control  
As previously described in section 1.13 (b), the BCD control system allows ten crosspoints to be controlled with only four control leads. See AP176 - AP476, XP177 - XP477 instructions for a more detailed description. Also, see Figure 1-1 for line encoding information.
- 1.25 Output Muting  
The output muting circuit, when wired, provides for remote muting of the three watt output as described in paragraph 1.17. For details on adjustment of the partial muting, see AM178, AM278, AM378, AM378T, AM379, AM478, AM478T, AM479 manual.

Optional Equipment

- 1.26 CP7101 or CP7102 Control Panel  
Each panel contains five lever keys and is designed for flush mounting in a desk top. The keys are three position (centre off) and may be locking (L), non-locking (NL), or L-NL.
- 1.27 CS9000-2 Control Panel  
This panel contains up to ten lever keys and is designed for flush mounting in a desk top. The keys are three position (centre off) and may be locking (L), non-locking (NL) or L-NL. It is designed to be used with BCD control and contains a circuit board for mounting the encoding diodes.
- 1.28 SA601 Speaker  
The SA601 is an 8 ohm enclosed speaker; with volume control, designed for placement on a desk.

Mechanical Details

- 1.29 The intercom system is completely contained in a single 5¼ inch high, equipment frame. This frame mounts in a standard 19 inch equipment rack.
- 1.30 All connections, both audio and control, are made by cables to standard 50 pin subminiature 'D' connectors on the rear of the intercom frame. No direct solder connections are required.
- 1.31 The input amplifier and matrix modules and output amplifiers are built on glass-epoxy printed circuit cards attached to metal guide plates. Circuit connections are made by a 72 pin card edge connector.
- 1.32 The power supply is contained in an enclosed, ventilated, chassis which is mounted in the intercom frame as a plug-in unit. Circuit connections are made by a 24 pin "blue ribbon" connector.

- 1.32 The  $\pm 4$  volt sub-regulator is built on a glass-epoxy printed circuit card which plugs into a 15 pin edge connector located behind the frame rear panel. The circuit card is retained in the connector by a sponge rubber pad on the inside surface of the hinged rear panel.
- 1.33 The relay timer is built on a glass-epoxy printed circuit card mounted to the rear of the frame, behind the rear panel, with brackets and a mounting plate.

BCD Control Lines	8	4	2	1
Matrix Board Pins, Units	31	33	35	37
Matrix Board Pins, Tens	32	34	36	38
Cable Connector, Units	20	21	22	23
Cable Connector, Tens	24	25	26	27

Table 1: Pin Connections

		BCD Control Lines			
		8	4	2	1
Decimal Number	0	0	0	0	0
	1	0	0	0	1
	2	0	0	1	0
	3	0	0	1	1
	4	0	1	0	0
	5	0	1	0	1
	6	0	1	1	0
	7	0	1	1	1
	8	1	0	0	0
	9	1	0	0	1

0 Indicates the control line pulled down. Connected to -4V control.

1 Indicates control line pulled up. Not connected to -4V control.

Table 2: Truth Table

Figure 1-1: BCD Control Wiring



Section 2. SPECIFICATIONS

- 2.01 Input levels and source impedances with AGC section bypassed:
- (a) AP176 - AP476 input amplifiers
    - 1. Dynamic Microphone: -60 dBm, 150 ohms nominal
    - 2. Carbon Microphone: -25 dBm, 50 ohms nominal
    - 3. Line: 0 dBm, 600 ohms.
  - (b) OL76 input amplifier
    - 1. Dynamic Microphone: -60 dBm, 150 ohms nominal
    - 2. Line One: -10 dBm, 600 ohms
    - 3. Line Two: +8 dBm, 600 ohms.
- 2.02 Maximum output levels and load impedances (Output Amplifier):
- (a) +18 dBm and 0 dBm, 600 ohms
  - (b) 3 watts, 8 ohms
  - (c) 3 watts (+35 dBm) 600 ohms, strappable to 150 ohms with two splits on AM478T, which has output transformers.
- 2.03 Input levels with AGC section inserted, dynamic microphone input, nominal:
- (a) -70 dBm to -60 dBm, Linear gain
  - (b) -60 dBm to -40 dBm, 2 dB change at output.
- 2.04 Frequency Response:  
±2 dB, 100 Hz to 10 kHz.
- 2.05 Distortion
- (a) AM478
    - 1% maximum, 100 Hz to 10 kHz, at rated output level
  - (b) AM478T
    - 1% maximum, 150 Hz to 10 kHz, at rated output level.
- 2.06 Equivalent input noise (dynamic microphone):  
Better than -115 dBm.
- 2.07 Crosstalk:  
Better than 55 dB below +18 dBm, 100 Hz to 10 kHz, at test level.
- 2.08 External circuit drivers:  
Maximum voltage: 40 volts  
Maximum current: 75 mA.
- 2.09 Power Requirement:  
117 volts AC, 50/60 Hz (230 volts supplied on request), approx. 105 VA.
- 2.10 Weight:  
Approximately 40 lb.
- 2.11 Dimensions:  
19" W x 5½" H x 16½" D.

Section 3 INSTALLATIONMounting

- 3.01 The intercom is designed to be mounted in a standard 19 inch equipment rack, taking  $5\frac{1}{4}$  inches of panel space.
- 3.02 Normally, the intercom is shipped with all modules in place and held by means of shipping bars. These bars may be removed after installation is completed. If unusual shipping conditions necessitate removing and packing modules separately, install the modules in the correct slots by referring to the designations on the module guide plates and matching these with the numbers on the frame layout diagram, Figure 7-1.

Wiring Connections

- 3.03 All wiring is done to 50 pin subminiature 'D' connectors mounted on the intercom rear panel. See Figure 7-3. Each of the ten connectors contains all the audio and control connections for a particular station. See Figure 7-3 for the connections necessary in fabricating the cables.
- 3.04 Wiring should be segregated according to level and function; i.e. audio inputs (microphone or line), audio outputs (speaker or line) and DC control. DO NOT lace together pairs of more than 30 dB difference in level.
- 3.05 In order to prevent degradation of the crosstalk, adjacent input amplifiers should not be assigned so as to have input levels differing by more than 45 dB. In other words, an input amplifier set for line input (0 dBm) should not be next to one set for dynamic microphone input (-60 dBm).
- 3.06 Audio input wiring should consist of shielded twisted pairs such as McCurdy SA12002 (22 gauge, stranded), while the output wiring, for 3 watt outputs, should be Belden 8790 (18 gauge, stranded). Ground the shields only at the common-system ground pins on the cable connector.
- 3.07 Control Panel  
The standard control panel for the intercom is a McCurdy CP7102 using five 3-position lever keys with 2C contacts. A wiring diagram is supplied with the panel. Please read the notes on the diagram which refer to various wiring configurations pertaining to the types of keys installed. Where extra contacts are required for external muting, order the optional CP7101 key panel with 3-position 4C keys. When the optional BCD cross-point control is utilized, the CS9000-2 key panel must be used. This panel is supplied with up to ten 3-position lever keys. Refer to the notes on the diagram supplied with this panel for the proper wiring connections.

3.08 Grounding

System ground and chassis ground are tied together by a jumper attached to TB1, 3, 4 & 5 and the intercom chassis. In some systems, it may improve the noise figure to separate these grounds by removing the jumper and connecting a 10 gauge, stranded, insulated wire from TB1, 3, 4 & 5 to station ground.

3.09 AC power is obtained by plugging the intercom power cord into a 117 volt, 60 Hz, single phase, three wire source.

Section 4 OPERATION

- 4.01 To turn on the intercom system, move the power switch on the power supply to the 'on' position. The two indicator lamps should light, showing that  $\pm 15$  volts is present at the output of the power supply.
- 4.02 The control panel switches should be designated to identify the stations that can be called. Move the switch up or down, as applicable, to call a station by means of the microphone.

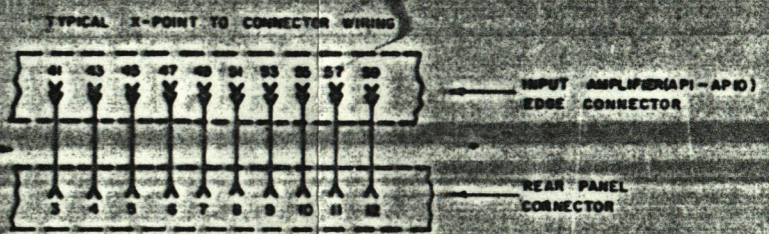
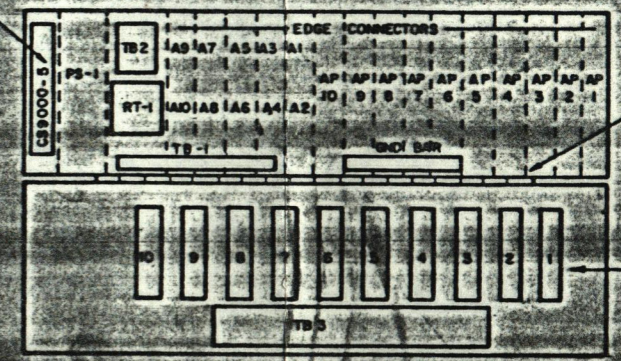
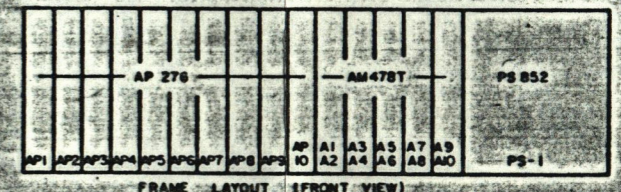
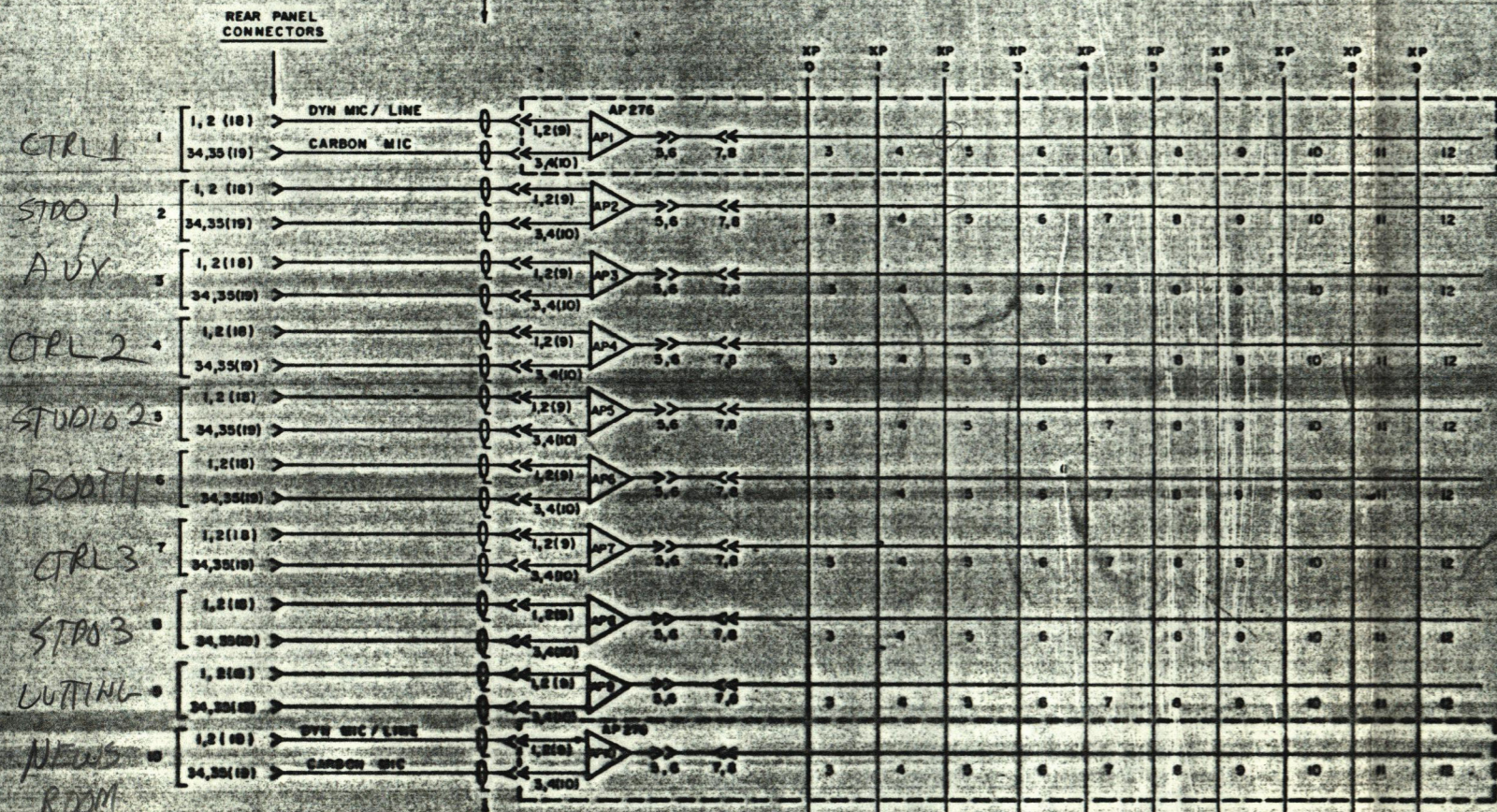
Section 5 MAINTENANCE

- 5.01 Very little maintenance should be required for the intercom on a system basis, except to keep the equipment clean and free from dust. Regular inspections should be carried out in this regard. At the same time, components and wiring should be checked for any signs of deterioration.
- 5.02 The amplifiers and power supply may be removed for bench testing or replacement. Do not remove or replace units when the power is applied. For service and test data, refer to the individual instructions for these units.
- 5.03 The intercom rear panel is hinged to provide access to components and wiring at the rear of the frame. To lower the panel, remove the two screws in the upper left and right corners of the panel.
- 5.04 The majority of connections on both the printed circuit card connectors and rear panel connectors are Wire-Wrapped. Special wire is used for this application. If another type wire is used for repair or other reasons, the connections must be soldered, even if applied with the proper Wire-Wrap equipment.
- 5.05 An EM906-1 extender module is supplied with the CS9100 to enable the modules to be tested and adjusted while operating in the system. An extender module with a metal guide and PC card support, the EM906M-1, and one with test turrets on the PC board, the EM906-2, are available as accessories at extra cost.

Section 6 PARTS LIST

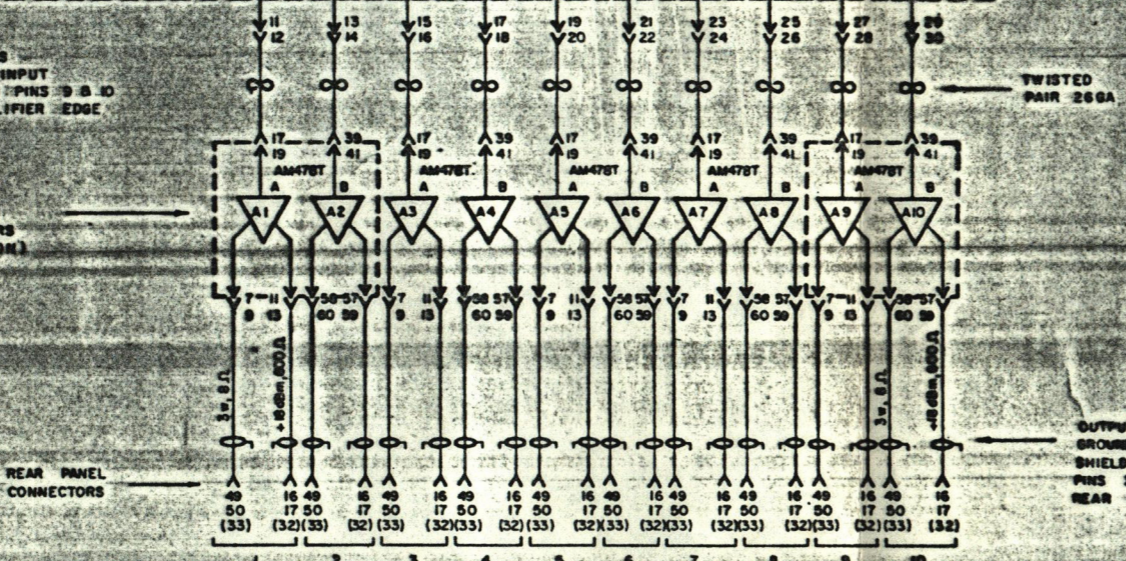
<u>Reference Designation</u>	<u>Supplier and Part Number</u>	<u>Description</u>
AP1 - AP10	McCurdy AP176 McCurdy AP276 McCurdy AP376 McCurdy AP476	Preamplifier and Switching Matrix
AM1 - AM5	McCurdy AM278 McCurdy AM478 McCurdy AM478T	Output Amplifier
±4V Regulator	McCurdy CS9000-4	±4V Regulator
Power Supply	McCurdy PS852 McCurdy PS852A	±15V Power Supply
Relay Timer	McCurdy RT613	Relay Timer, delay
J1 - J15	AMP 530355-8	72 pin PC Connector
J16	Amphenol 26-4101-24	24 pin Power Supply Connector
J17	Elco 006007-015-940-002	15 pin PC Connector
P1 - P10	AMP 205740-4 AMP 205817-1	Panel Connectors P1 - P10 Mounting Screws
J1 - J10 (Cable)	Cannon DD50P AMP 205980-1 AMP 205732-1 McCurdy A852/5-3 McCurdy A852/5-4 McCurdy AMR1-13-4 McCurdy A9100/5-2 McCurdy A9100/5-3 GC6261	Cable Connector J1 - J10 Safety Screws J1 - J10 Cover & Clamp J16 Mounting Plate J16 Cover J16 Spacer J17 Mounting Plate RT613 Mounting Plate RT613 Brackets

**INPUT LEVELS:**  
 DYN MIC -50 dBm, 150 Ω  
 LINE +10 dBm, 600 Ω (BRI)  
 CARB MIC -15 dBm, 50 Ω



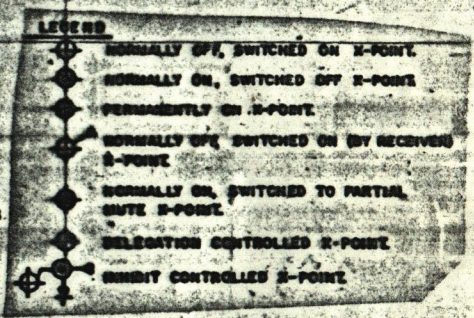
INPUT SHIELDS GROUNDED AT INPUT SHIELD BUS ON PINS 9 & 10 OF INPUT AMPLIFIER EDGE CONNECTORS

EACH CARD CONTAINS TWO OUTPUT AMPLIFIERS (A & B SECTION)



OUTPUT SHIELDS GROUNDED AT SHIELD BUS ON PINS 32 & 33 OF REAR PANEL CONNECTORS

- NOTES:**
- LEVELS SHOWN ARE MAXIMUM LEVELS; OPERATING LEVELS ARE 10dB LOWER.
  - EACH X-POINT HAS A CONNECTOR PIN NUMBER AS INDICATED.
  - X-POINT CONTROL IS -4V OFF GND.
  - STANDARD 1010 INTERCOM COMES WITH ALL 100 X-POINTS SUPPLIED.
  - DYN MIC, LINE AND CARB MIC INPUTS ARE PRESELECTED WITHIN THE INPUT AMPLIFIERS.



CTRL 1 STDO 1 AUX CTRL 2 STDO 2 BOOTH CTRL 3 STDO 3 CUTTING ROOM NEWS ROOM

ISSUE 2  
 26 AUG 77  
 CS 9100-4 CHANGED TO CS 9100-5. SC

TOLERANCES UNLESS OTHERWISE SPECIFIED	DECIMAL ± .005 FRACTIONAL ± 1/64 ANGULAR ± 1/2°	DRAWN- SC	APPROVED-
MATERIAL-		CHECKED-	SCALE-
FINISH-		DATE- 29 JUNE 77	
ALL DIMENSIONS IN INCHES DO NOT SCALE			

**McCURDY RADIO INDUSTRIES**

**CS 9100**  
 10x10 INTERCOM  
 AUDIO FUNCTIONAL AND FRAME LAYOUT

D-9100/1-1





INSTRUCTIONS  
PREAMPLIFIER & MATRIX  
AP276 & XP277

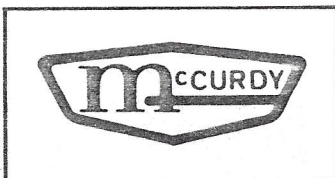
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Connector Wiring	A-277/8-2

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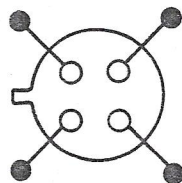
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ADDENDUM TO ALL AMPLIFIERS USING THE AGC AMPLIFIER EMPLOYING MOSFET MFE 3003 (MOTOROLA).

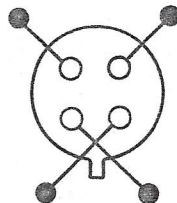
DUE TO AVAILABILITY, SOME PRODUCTION RUNS MAY NOT HAVE MOTOROLA MFE 3003 FETS IN THEM, BUT MAY BE REPLACED BY INTERSIL 3N163. THIS FET HAS THE SAME CHARACTERISTICS, BUT THE 'PIN OUT' IS DIFFERENT.

TOP VIEW



MOTOROLA MFE 3003

TOP VIEW



NOTE: THE 3N163 is turned 90° CCW, and the leads at the locating tab are reversed.

AP176, 276, 376, 476

AP676

AP175, AP195

CP287 (287-1)

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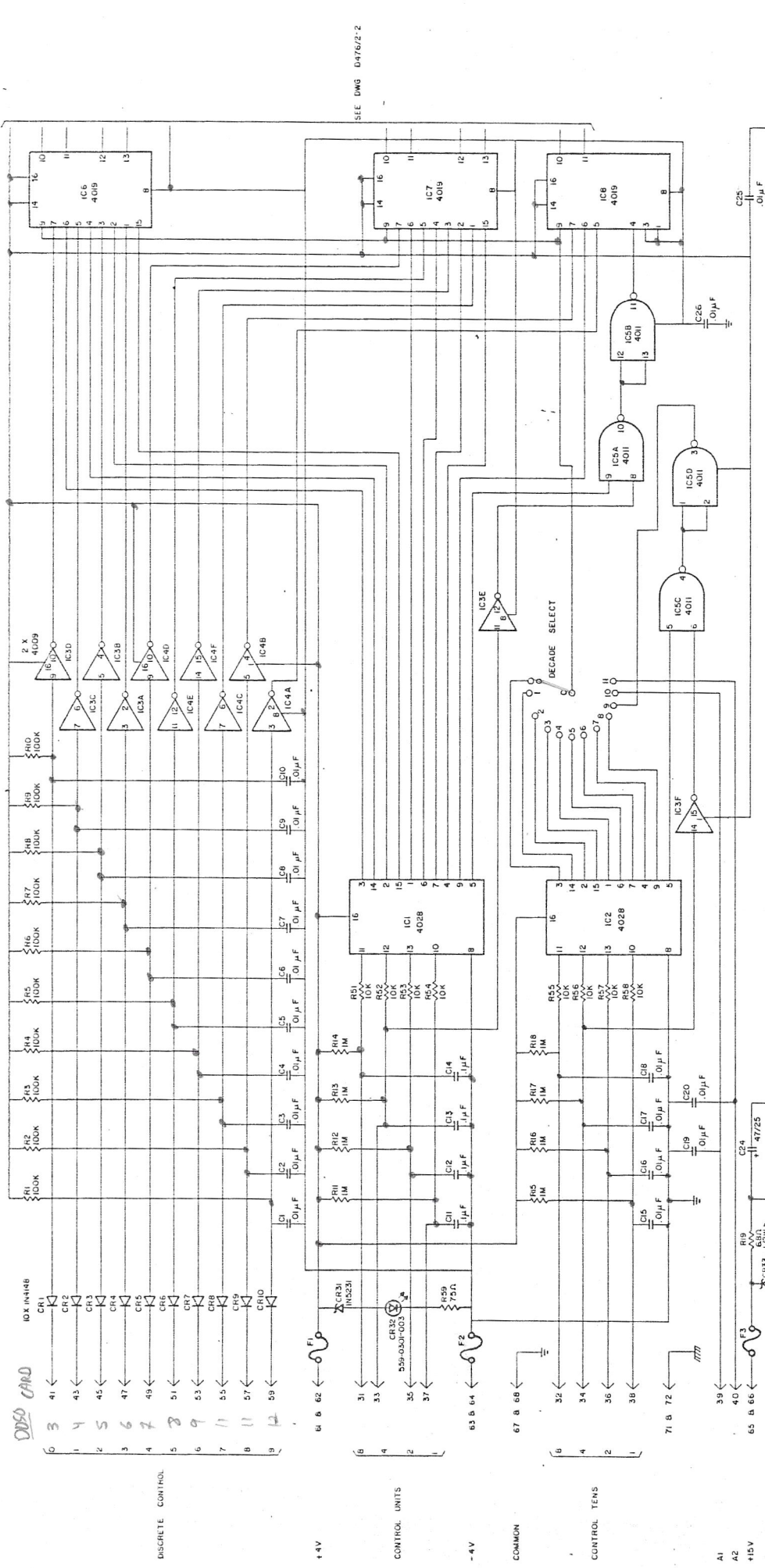
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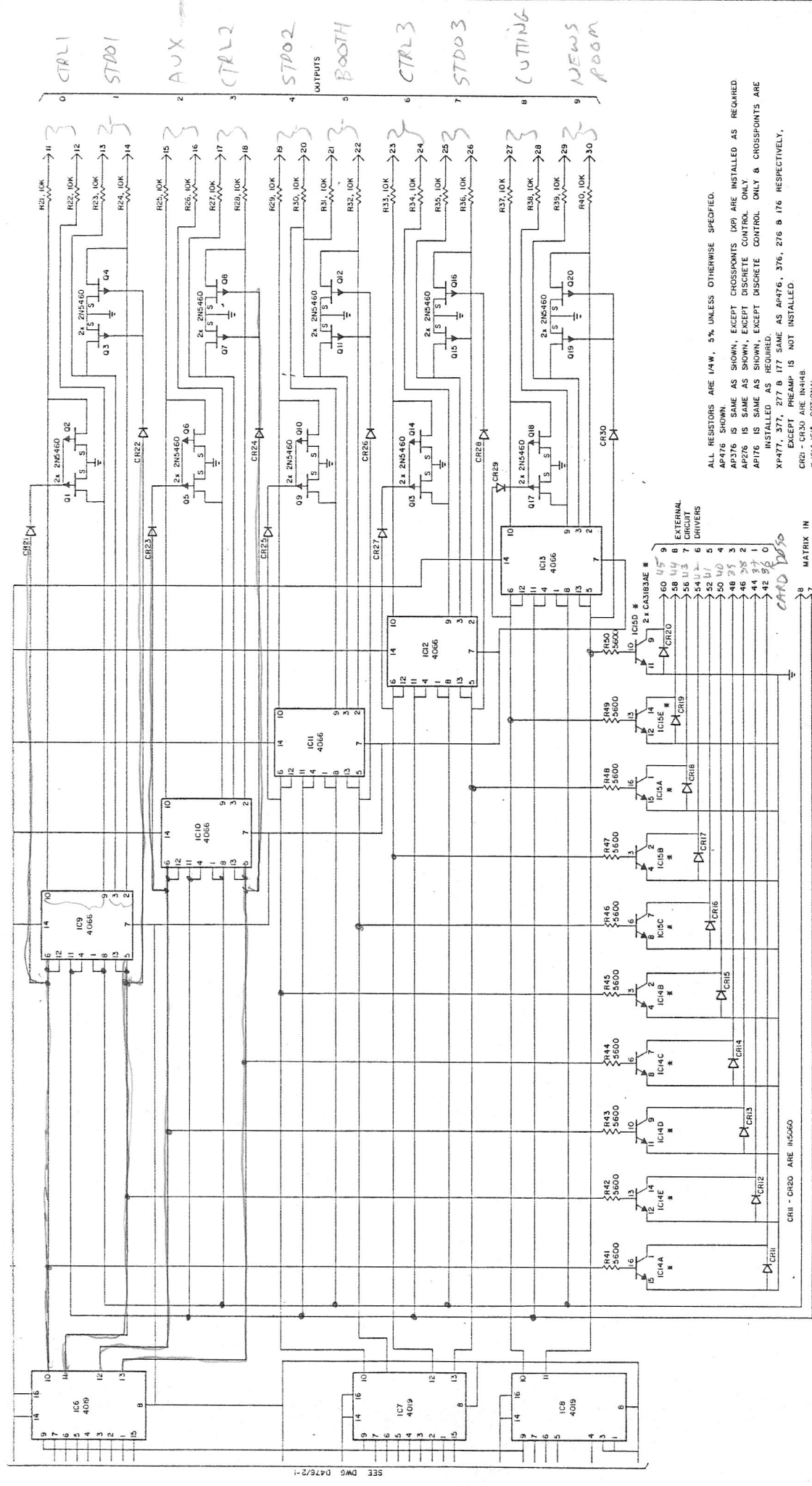


McCurdy Radio Industries reserves the right, without notice to make such changes in equipment, design, specifications, or components as progress in engineering or manufacturing techniques may warrant to improve the performance of the product.



FOR PREAMP SCHEMATIC, SEE DWG. D-4762-3  
 ALL RESISTORS ARE 1/4W, 5% UNLESS OTHERWISE SPECIFIED  
 AP476 IS SAME AS SHOWN, EXCEPT F1,2,3,4, CR31,32,33,34, AND R59, R60 ARE NOT INSTALLED.  
 AP376 IS SAME AS AP476, EXCEPT CROSSPOINTS (XPI) ARE INSTALLED AS REQUIRED.  
 AP276 IS SAME AS AP476, EXCEPT DISCRETE CONTROL ONLY & CROSSPOINTS ARE INSTALLED AS REQUIRED.  
 AP176 IS SAME AS AP476, EXCEPT DISCRETE CONTROL ONLY & CROSSPOINTS ARE INSTALLED AS REQUIRED.  
 YP677, 477, 377, 277 & 177 ARE SAME AS AP476, 476, 376, 276 & 176 RESPECTIVELY, EXCEPT PREAMP IS NOT INSTALLED.  
 AP676 IS SAME AS SHOWN, EXCEPT DISCRETE CONTROL ONLY.

MAY 16/80		APPROVED: [Signature]	
ICE N 0689 DAB	DATE	DESIGNED BY: VW	SCALE
LINE ADDED FROM:	REV	CHECKED BY: BL	DATE: OCT 9/74
KN 240/778	7	ALL DIMENSIONS IN INCHES	
NOTES REVISIONS	6	• DO NOT SCALE	
CR2 & C24 WERE KOOLZ	5		
KN 0/79	4		
CR2 WAS 590-0201-003	3		
KN 5/79	2		
AP476 & XPI677 NOTES	1		
KN OCT 26/78			
ADD			
CR1,32,33 & CR34			
R59, R60, F1,2,3 & R4			
WA FEB 5/75			
REVISD			
PN 6 WAS 8 PRE-INST			
WAS 63, PINS 5, WAS 7			
PN 6 WAS 82, PINS 2			



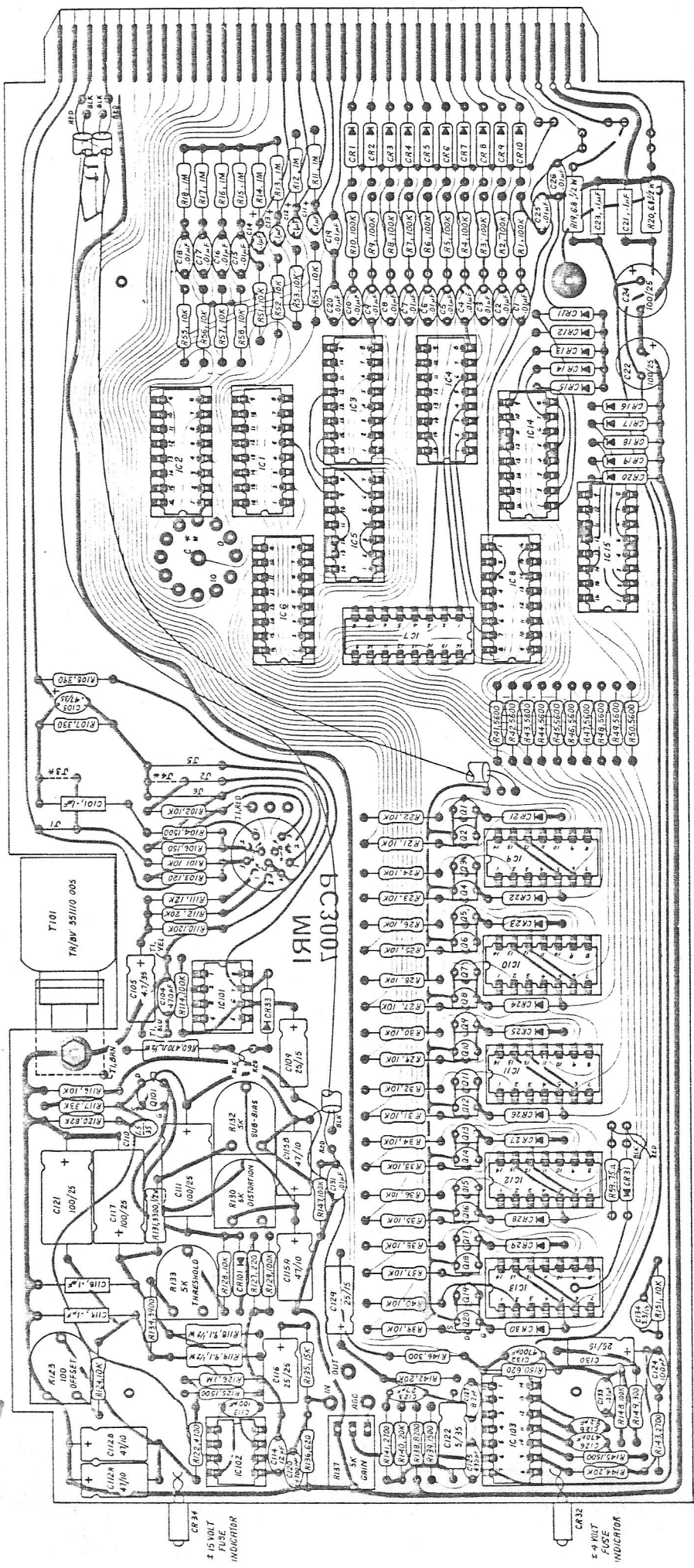
0 CTRL1  
 1 STDO1  
 2 AUX  
 3 CTRL2  
 4 STDO2  
 5 BOOTH  
 6 CTRL3  
 7 STDO3  
 8 CUTTING  
 9 NEWS  
 ROOM

ALL RESISTORS ARE 1/4W, 5% UNLESS OTHERWISE SPECIFIED.  
 AP476 SHOWN  
 AP376 IS SAME AS SHOWN, EXCEPT CROSSPOINTS (XPI) ARE INSTALLED AS REQUIRED  
 AP276 IS SAME AS SHOWN, EXCEPT DISCRETE CONTROL ONLY  
 AP176 IS SAME AS SHOWN, EXCEPT DISCRETE CONTROL ONLY & CROSSPOINTS ARE INSTALLED AS REQUIRED  
 XP477, 377, 277 & 177 SAME AS AP476, 376, 276 & 176 RESPECTIVELY, EXCEPT PREAMP IS NOT INSTALLED.  
 CR20 - CR30 ARE IN4148  
 IC1, IC15 OPTIONAL

DAB MAR 16/80 LINE FROM IC6 TO IC9 ADDED CN 0689 ROME JUNE 22/78 K.J.P. IC9 - 13 WERE SEPT 13/76 BB IC14, IC15 OPTIONAL VM JULY 2/75 M4004 VM MAR 08/75 PIN 8 WAS 7, PIN 7 M45 VM FEB 4/75 PIN 7 WAS 9, PIN 8		APPROVED: <i>[Signature]</i> VM CHECKED: <i>[Signature]</i> BL DATE: OCT 11/74 ALL DIMENSIONS IN INCHES DO NOT SCALE	
ORIGINAL: 8 1/4" PRACTICAL: 8 1/4" PAPER: 8 1/2" x 11" DATE:		MCGUIRE RADIO INDUSTRIES LIMITED 1000 COLLETT ST. - OXFORD AP476 PREAMP & MATRIX SCHEMATIC	
PARTS LIST:		CS3000 D 476/2-2	

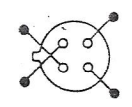
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NOTE: WHEN INTERSIL 9N109 IS SUBSTITUTED FOR MOTOROLA MFE 9003 INSTALL THIS WAY.

THE 9N109 IS TURNED 90° CCW, AND THE LEADS AT THE LOCATING TAB ARE REVERSED.



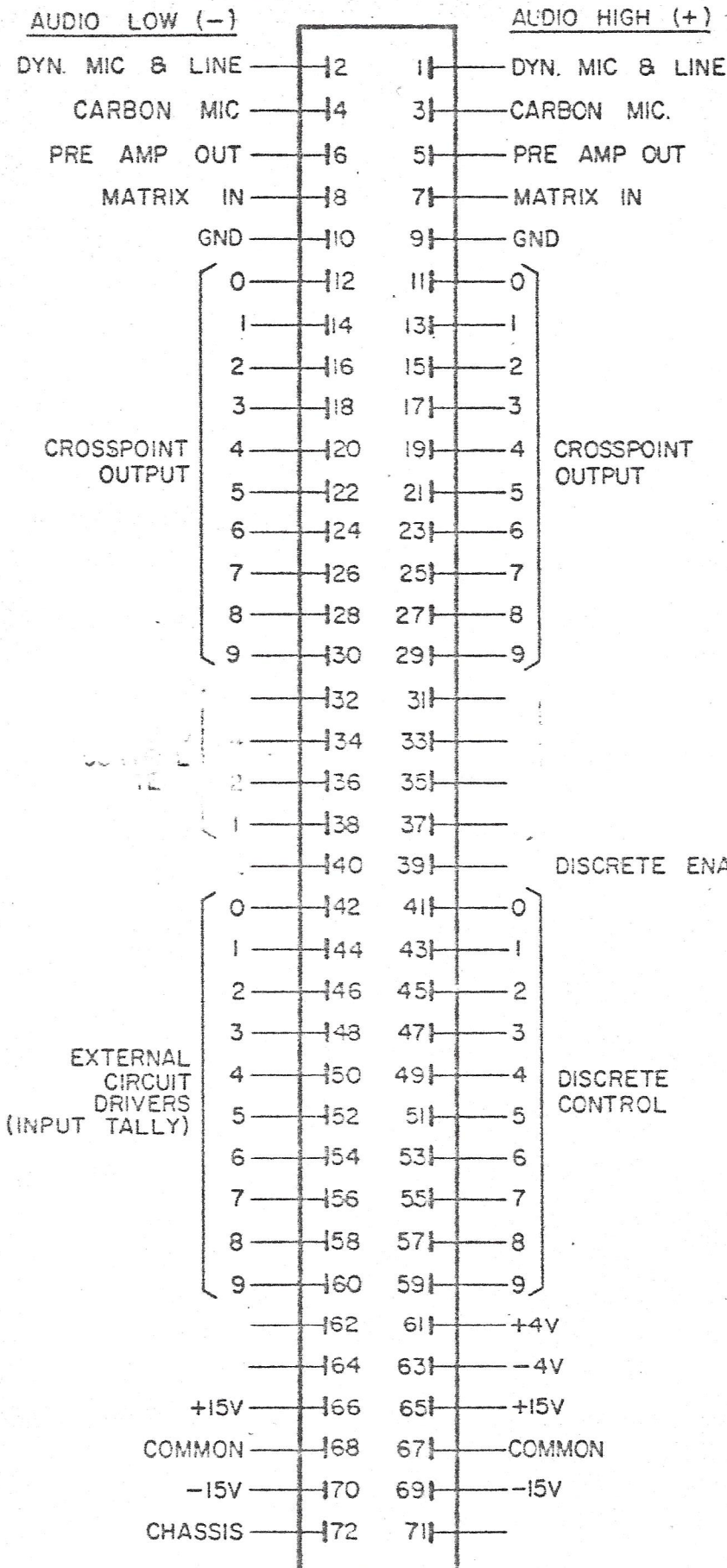
AP 476 SHOWN  
 AP 376 SAME EXCEPT IC 9 - IC13  
 INSTALL AS REQUIRED.  
 AP 216 SAME EXCEPT IC12 & 5  
 NOT INSTALLED.  
 AP176 SAME EXCEPT IC12 & 5 NOT  
 INSTALLED AND IC9-IC13 INSTALLED  
 CR 31,32,33,34,35,46B OPTIONAL.

IC101 IS MC1741CPI.  
 IC102 IS MC1704CPI.  
 IC103 IS MC1437P.  
 IC104 IS MFE 3003.  
 CR101 IS IN5060.  
 CR102 IS IN5231.  
 CR103 IS IN4747A.  
 CR104 IS 555-0501-003.  
 \* J3 IS J4 OPTIONAL. WHEN INSTALLED  
 REMOVE J1 & J2.  
 USE SOCKETS FOR ALL IC'S.  
 IC 14 & IC15 OPTIONAL.  
 \*\* AP176 & AP179 TERMINALS AS SHOWN  
 FOR AP376 & AP476 ALL 13 TERMINALS ARE USED.

NOTES:  
 ALL RESISTORS ARE 1/4 W. 5%,  
 UNLESS OTHERWISE SPECIFIED.  
 CR1-CR10 & CR 21-CR30 ARE IN4148  
 CR11-CR20 ARE IN5060.  
 CR21-CR30 ARE IN5060.  
 CR31-CR40 ARE CD4020B.  
 CR41-CR42 ARE CD4009 RE.  
 CR43 IS CD4011E.  
 CR44 IS CD4047 RE.  
 CR45-CR46 ARE CD4066 RE.  
 CR47-CR48 ARE CD4011 RE.  
 CR49 IS 555-0101-003.

MCCURDY RADIO INDUSTRIES		COMPONENT LAYOUT AND ASSEMBLY		AP476		PREAMP & MATRIX	
UNITS-	CS9000	UNIT-	CS9000	UNIT-	CS9000	UNIT-	CS9000
APPROVED-		APPROVED-		APPROVED-		APPROVED-	
SCALE-	2:1	SCALE-	2:1	SCALE-	2:1	SCALE-	2:1
DATE-	OCT 25/78	DATE-	OCT 25/78	DATE-	OCT 25/78	DATE-	OCT 25/78
DESIGN-	JS	DESIGN-	JS	DESIGN-	JS	DESIGN-	JS
ALL DIMENSIONS IN INCHES DO NOT SCALE.				ALL DIMENSIONS IN INCHES DO NOT SCALE.			
TOLERANCES UNLESS OTHERWISE SPECIFIED				TOLERANCES UNLESS OTHERWISE SPECIFIED			
DECIMAL FRACTIONAL ANGULAR				DECIMAL FRACTIONAL ANGULAR			
DRAWN--KV				DRAWN--KV			
CHECKED--				CHECKED--			
MATERIAL--				MATERIAL--			
FINISH--				FINISH--			
REVISIONS & REPAIRS				REVISIONS & REPAIRS			
18	REVISIONS & REPAIRS	18	REVISIONS & REPAIRS	18	REVISIONS & REPAIRS	18	REVISIONS & REPAIRS
17	NOTE AND DIAGRAM FOR	17	NOTE AND DIAGRAM FOR	17	NOTE AND DIAGRAM FOR	17	NOTE AND DIAGRAM FOR
16	35 ADDED CN155	16	35 ADDED CN155	16	35 ADDED CN155	16	35 ADDED CN155
15	RESISTOR FET HOOD	15	RESISTOR FET HOOD	15	RESISTOR FET HOOD	15	RESISTOR FET HOOD
14	RESISTOR FET HOOD	14	RESISTOR FET HOOD	14	RESISTOR FET HOOD	14	RESISTOR FET HOOD
13	OPTIONAL NOTE MOVED	13	OPTIONAL NOTE MOVED	13	OPTIONAL NOTE MOVED	13	OPTIONAL NOTE MOVED
12	CR32 WRS 555-0101-003	12	CR32 WRS 555-0101-003	12	CR32 WRS 555-0101-003	12	CR32 WRS 555-0101-003
11	CR32 WRS 555-0101-003	11	CR32 WRS 555-0101-003	11	CR32 WRS 555-0101-003	11	CR32 WRS 555-0101-003
10	CR32 WRS 555-0101-003	10	CR32 WRS 555-0101-003	10	CR32 WRS 555-0101-003	10	CR32 WRS 555-0101-003
9	CR32 WRS 555-0101-003	9	CR32 WRS 555-0101-003	9	CR32 WRS 555-0101-003	9	CR32 WRS 555-0101-003
8	CR32 WRS 555-0101-003	8	CR32 WRS 555-0101-003	8	CR32 WRS 555-0101-003	8	CR32 WRS 555-0101-003
7	CR32 WRS 555-0101-003	7	CR32 WRS 555-0101-003	7	CR32 WRS 555-0101-003	7	CR32 WRS 555-0101-003
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4	CR32 WRS 555-0101-003	4	CR32 WRS 555-0101-003	4	CR32 WRS 555-0101-003	4	CR32 WRS 555-0101-003
3	CR32 WRS 555-0101-003	3	CR32 WRS 555-0101-003	3	CR32 WRS 555-0101-003	3	CR32 WRS 555-0101-003
2	CR32 WRS 555-0101-003	2	CR32 WRS 555-0101-003	2	CR32 WRS 555-0101-003	2	CR32 WRS 555-0101-003
1	CR32 WRS 555-0101-003	1	CR32 WRS 555-0101-003	1	CR32 WRS 555-0101-003	1	CR32 WRS 555-0101-003





VIEWED FROM WIRING SIDE  
REAR OF CONNECTOR

**MCCURDY RADIO INDUSTRIES LIMITED**  
TORONTO - ONTARIO

**AP276**

CONNECTOR  
WIRING

DRAWING NO.

A 276/8-2

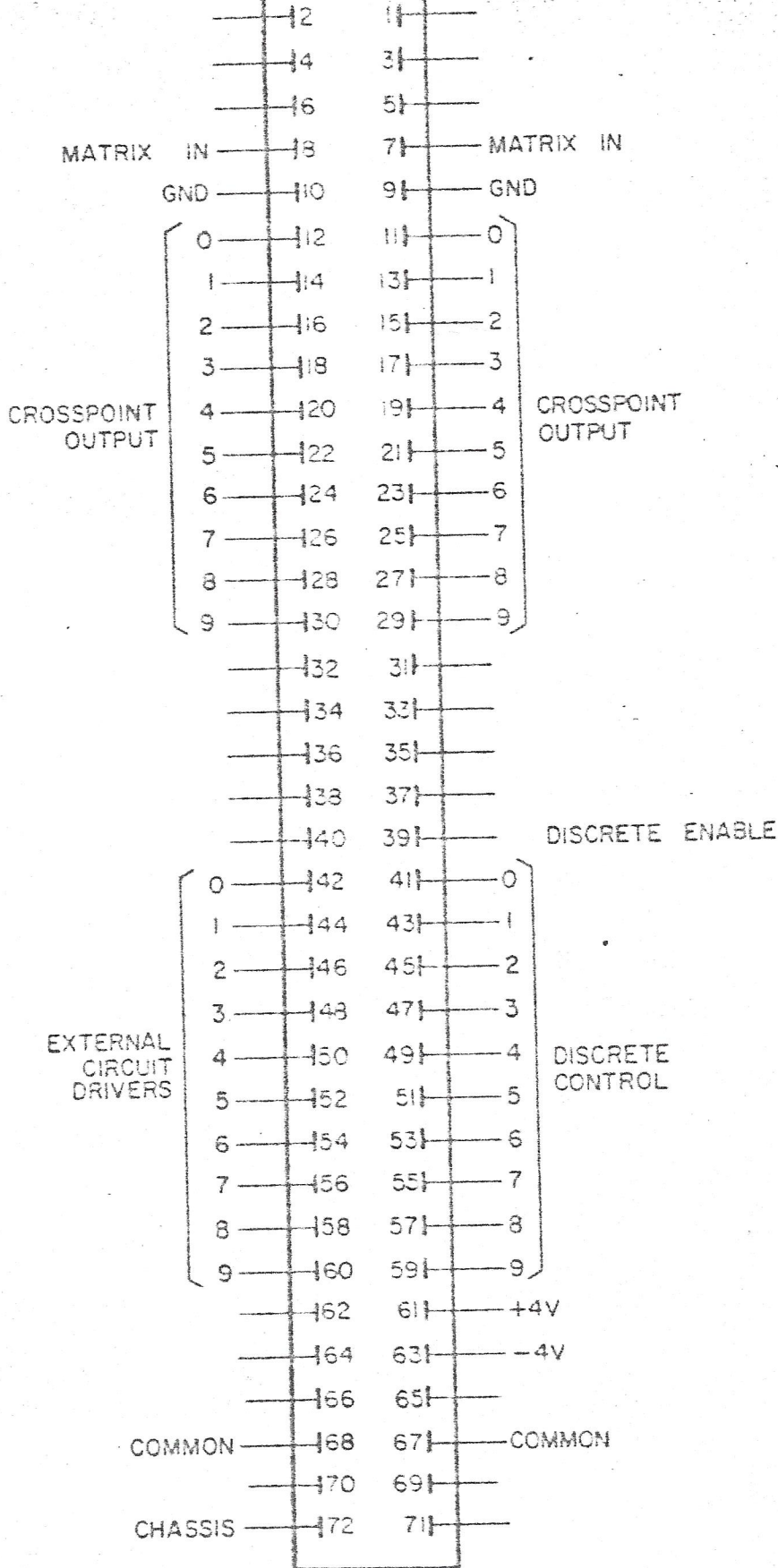
UNIT - CS9000

APPROVED - <i>[Signature]</i>	SCALE -	DATE - JAN 15/75	ALL DIMENSIONS IN INCHES DO NOT SCALE www.SteamPoweredRadio.Com
DRAWN - VW	CHECKED -	DESIGN -	
TOLERANCES UNLESS OTHERWISE SPECIFIED	DECIMAL ± .005	FRACTIONAL ± 1/64	MATERIAL -
	ANGULAR ± 1/2°		
FINISH -			



AUDIO LOW (-)

AUDIO HIGH (+)



VIEWED FROM WIRING SIDE  
REAR OF CONNECTOR

**ACCURDY RADIO INDUSTRIES LIMITED**  
TORONTO - ONTARIO

**XP277**

CONNECTOR  
WIRING

APPROVED - <i>[Signature]</i>	SCALE -	DATE - JAN 15/75
DRAWN - VW	CHECKED -	DESIGN -

ALL DIMENSIONS IN INCHES  
DO NOT SCALE

DECIMAL - 005  
FRACTIONAL - 1/64  
ANGULAR - 1/4  
TOLERANCES UNLESS OTHERWISE SPECIFIED

MATERIAL

FINISH -

DRAWING NO.

A 277/8-2

UNIT -  
CS9000

PRELIMINARY

INSTRUCTIONS  
AM478T  
OUTPUT AMPLIFIER

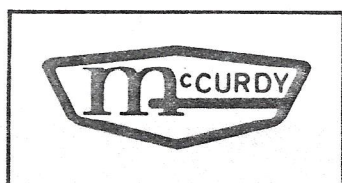
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Output Transformer Wiring	A-478T/8-3

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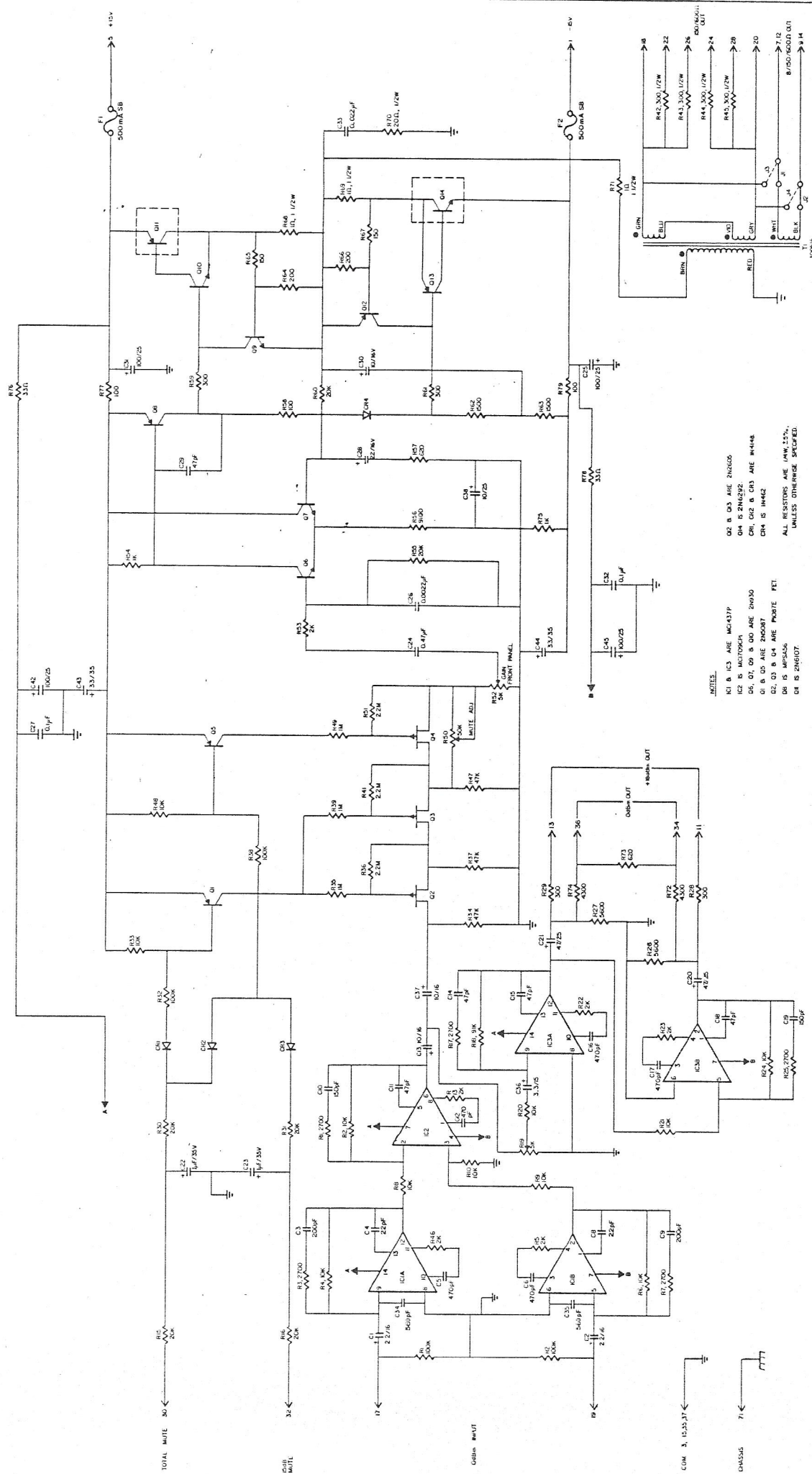


**McCURDY RADIO INDUSTRIES LIMITED**

108 CARNFORTH ROAD, TORONTO, ONTARIO M4A 2L4  
(416) 751-6262, TELEX 06-963533, TWX 610-492-1373

**McCURDY RADIO INDUSTRIES INC.**

1711 CARMEN DRIVE, ELK GROVE VILLAGE, ILLINOIS 60007,  
(312) 640-7077, TWX 910-222-0436



NOTES:  
 IC1 & IC3 ARE MC437P  
 IC2 IS MC702CA  
 D1, D2, D3 & D4 ARE 2N2630  
 D5, D7, D8 & D9 ARE 2N2630  
 D6 IS 2N2630  
 D8 IS 2N2630  
 D9 IS 2N2630  
 D10 IS 2N2630  
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 D99 IS 2N2630  
 D100 IS 2N2630

**McCORMY RADIO INDUSTRIES LIMITED**  
 TORONTO - ONTARIO

**AM478T**  
 OUTPUT AMPLIFIER A  
 SCHEMATIC

ALL DIMENSIONS IN INCHES  
 DO NOT SCALE

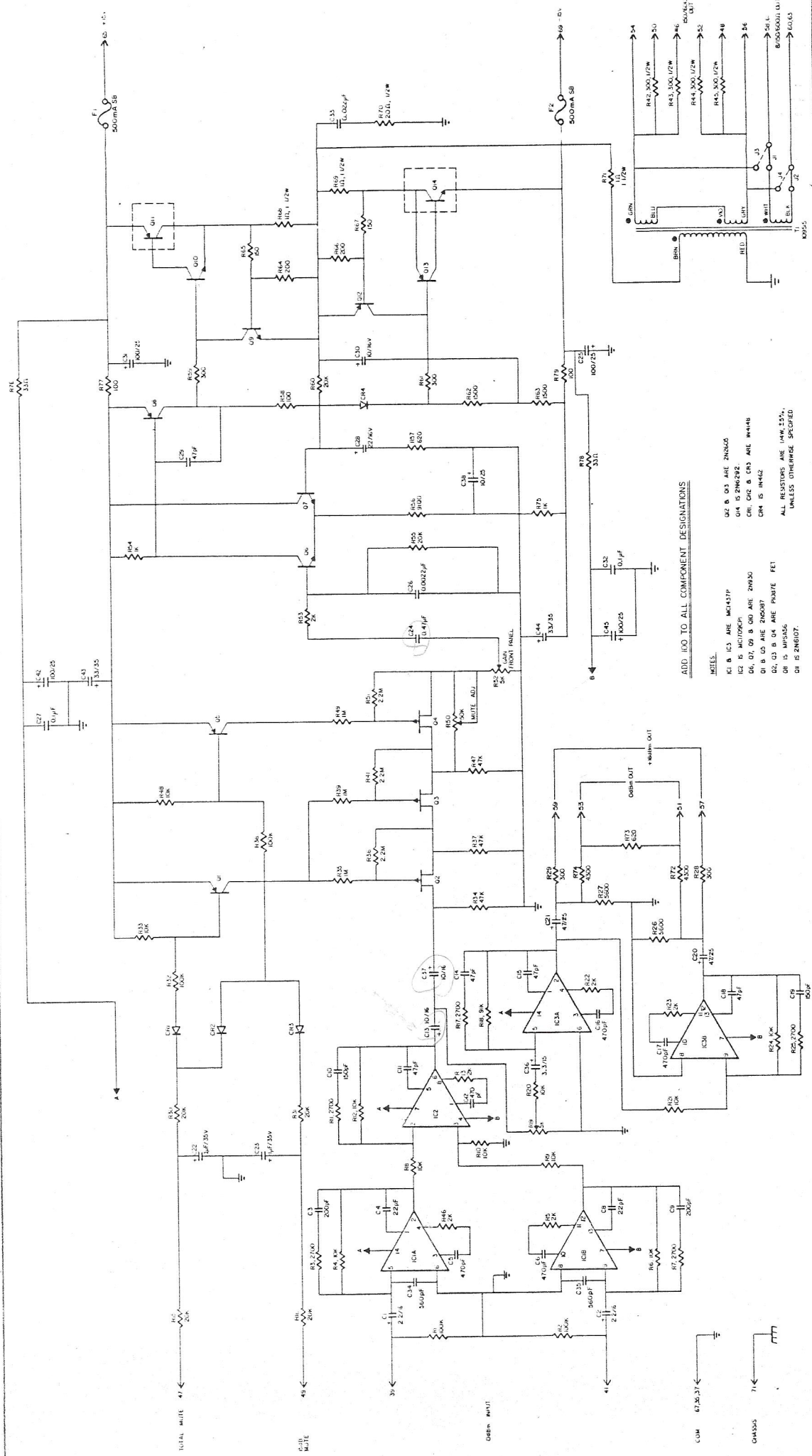
FORM: CS9000

REV. MAY 3/72

D-478T/2-1

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REV.	DATE	BY	DESCRIPTION
1	10/1/72	...	...
2	10/1/72	...	...
3	10/1/72	...	...
4	10/1/72	...	...
5	10/1/72	...	...
6	10/1/72	...	...
7	10/1/72	...	...
8	10/1/72	...	...
9	10/1/72	...	...
10	10/1/72	...	...



ADD 100 TO ALL COMPONENT DESIGNATIONS

- NOTES:
- IC1 & IC3 ARE MC1437P
  - IC2 IS MICROPC
  - Q1, Q2 & Q3 ARE 2N930
  - Q4 IS 2N6087
  - Q5 IS 2N6087
  - Q6, Q7 & Q8 ARE 2N930
  - Q9 IS 2N6087
  - Q10 IS 2N6087
  - Q11 IS 2N6087
  - Q12 IS 2N6087
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  - Q68 IS 2N6087
  - Q69 IS 2N6087
  - Q70 IS 2N6087
  - Q71 IS 2N6087
  - Q72 IS 2N6087
  - Q73 IS 2N6087
  - Q74 IS 2N6087
  - Q75 IS 2N6087

**MACURDY RADIO INDUSTRIES LIMITED**  
TORONTO - ONTARIO

**AM4781**  
OUTPUT AMPLIFIER B  
SCHEMATIC

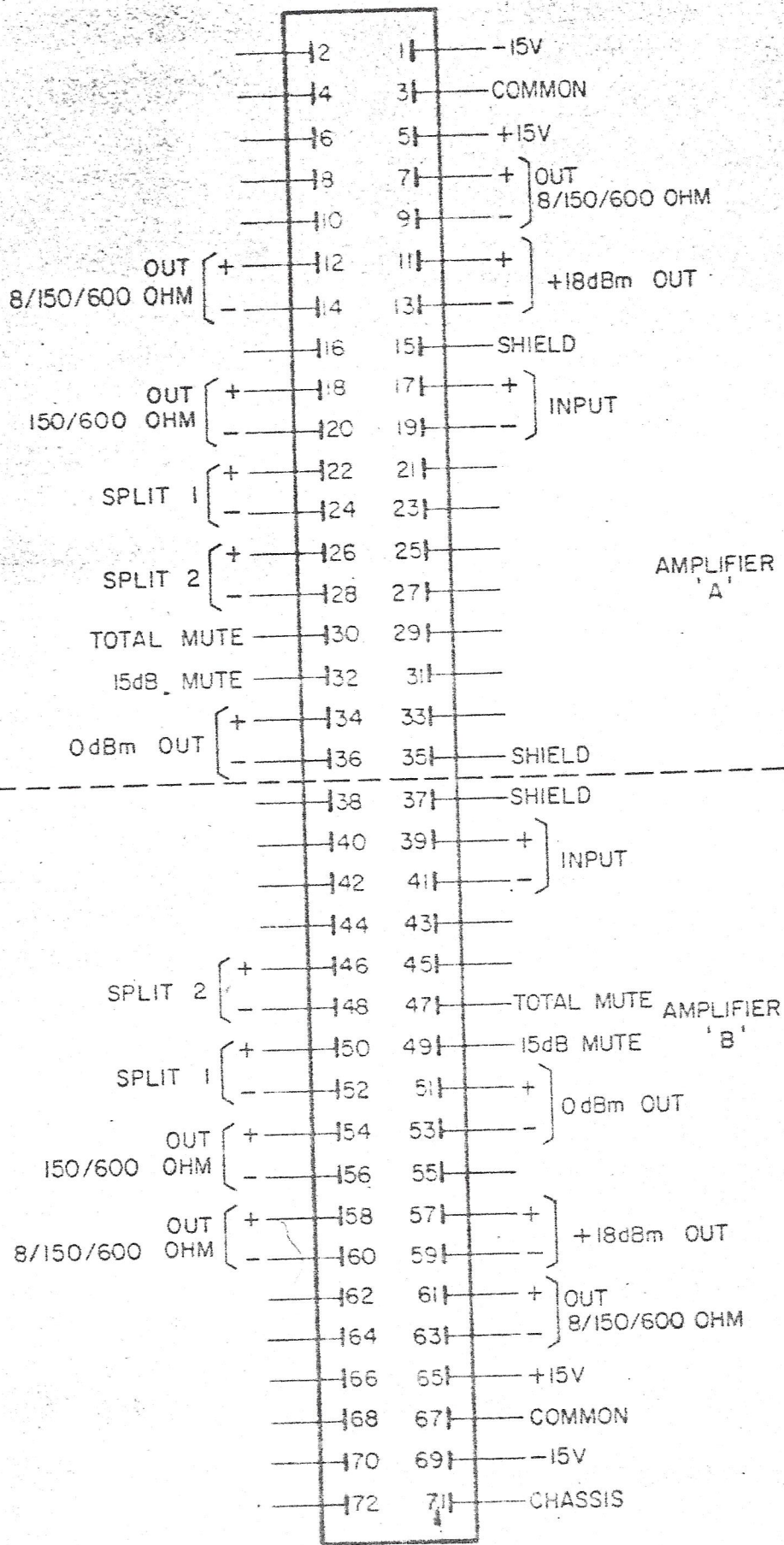
CS9000      D4781/2-2

REV. NO.	REV. DATE	REV. BY	REV. REASON	REV. DATE	REV. BY
1	10/1/78	W.M.	REVISED	10/1/78	W.M.
2	10/1/78	W.M.	REVISED	10/1/78	W.M.
3	10/1/78	W.M.	REVISED	10/1/78	W.M.
4	10/1/78	W.M.	REVISED	10/1/78	W.M.
5	10/1/78	W.M.	REVISED	10/1/78	W.M.
6	10/1/78	W.M.	REVISED	10/1/78	W.M.
7	10/1/78	W.M.	REVISED	10/1/78	W.M.
8	10/1/78	W.M.	REVISED	10/1/78	W.M.
9	10/1/78	W.M.	REVISED	10/1/78	W.M.
10	10/1/78	W.M.	REVISED	10/1/78	W.M.

ALL DIMENSIONS IN INCHES  
DO NOT SCALE

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VIEWED FROM WIRING SIDE  
REAR OF CONNECTOR

**MCCURDY RADIO INDUSTRIES LIMITED**  
TORONTO - ONTARIO

**AM478T**

CONNECTOR  
WIRING

APPROVED -	SCALE -	DATE -
<i>[Signature]</i>		MAY 8/75
DRAWN -	CHECKED -	DESIGN -
VW		

ALL DIMENSIONS IN INCHES  
DO NOT SCALE

DRAWING NO.

A 478T/8-2

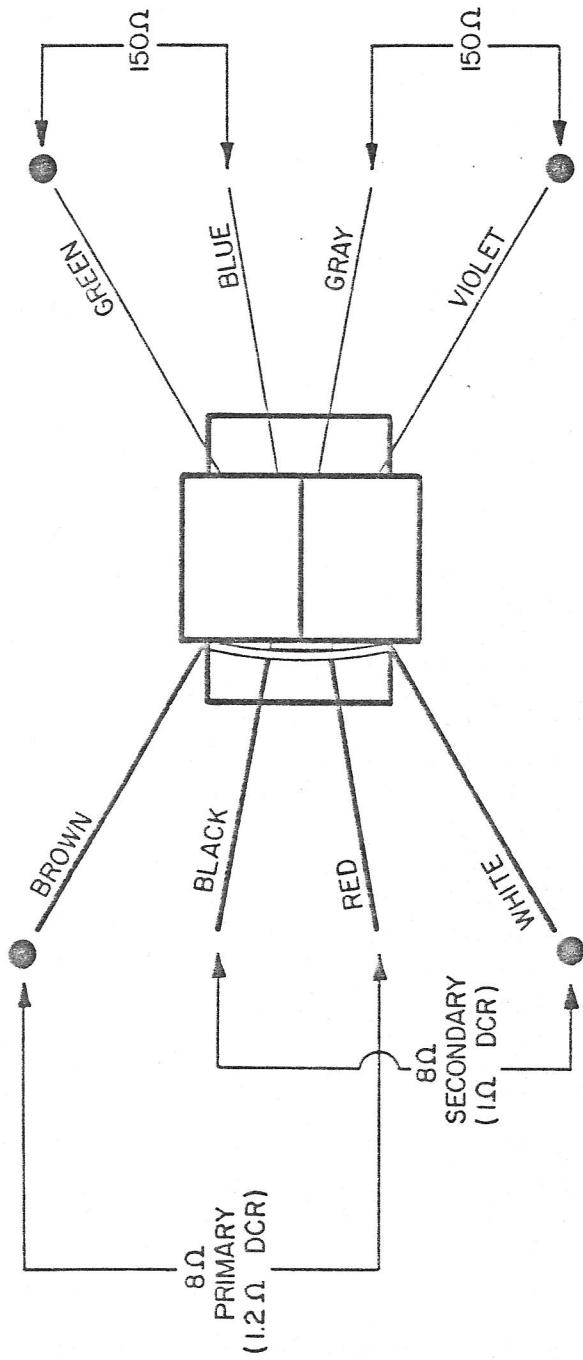
UNIT -

CS9000

DECIMAL ± .005  
FRACTIONAL ± 1/64  
ANGULAR ± 1/2°

MATERIAL

FINISH



TOP VIEW

COLOURS SHOWN ARE  
FOR EQUIVALENT CONNECTIONS  
ON 96587 TRANSFORMER  
(AM479)

**McCURDY RADIO INDUSTRIES LIMITED**  
TORONTO - ONTARIO

**478T**

HAMMOND 109515  
OUTPUT TRANSFORMER  
WIRING

APPROVED-	<i>[Signature]</i>
DRAWN-	VW
CHECKED-	
DESIGN-	
SCALE-	FULL SIZE
DATE-	MAY 5/75

ALL DIMENSIONS IN INCHES  
DO NOT SCALE

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UNIT-

DRAWING No.

A 478T/8-3

TOLERANCES UNLESS OTHERWISE SPECIFIED  
DECIMAL ± .005  
FRACTIONAL ± 1/64  
ANGULAR ± 1/2°

MATERIAL-

FINISH-

# INSTRUCTIONS PS852 REGULATED POWER SUPPLY

## INDEX

<u>Section</u>	<u>Subject</u>	<u>Page</u>
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2	Specifications	3
3	Installation	4
4	Circuit Description	6
5	Maintenance	9
6	Parts List	14

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5-2	Component Layout, PS852A Regulator	13

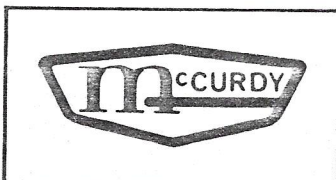
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### **McCURDY RADIO INDUSTRIES LIMITED**

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(416) 751-6262, TELEX 06-963533, TWX 610-492-1373

### **McCURDY RADIO INDUSTRIES INC.**

1711 CARMEN DRIVE, ELK GROVE VILLAGE, ILLINOIS 60007,  
(312) 640-7077, TWX 910-222-0436





AMENDMENT 1,  
November, 1979

INSTRUCTIONS  
PS848B, PS852, PS853, PS876A/48  
REGULATED POWER SUPPLIES

- (1) The following cartridge type LED'S replace the front panel mounted incandescent lamps. On units with LED'S installed, be sure to replace with the same type specified.

Replacements: (a) ELDEMA CD03-RCB-2810  
(b) DIALCO 507-4761-3335-500  
(c) LITTELFUSE 900-1-60L-061-RN

- (2) Add to PS853 Parts List (Section 6):

<u>REFERENCE</u>	<u>SUPPLIER &amp;</u>	
<u>DESIGNATION</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
- - -	ELDEMA DH0-10B-D14B	Lampholder (for LED'S)
	or LITTELFUSE 910-310X-241XX	

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**McCURDY RADIO INDUSTRIES INC.**

UNITED STATES HEAD OFFICE

1711 CARMEN DRIVE, ELK GROVE VILLAGE, ILLINOIS 60007, (312) 640-7077, TWX 910-222-0436

EAST COAST OFFICE

223 WEST SADDLE RIVER ROAD, SADDLE RIVER, N.J. 07458, (201) 327-0750, TWX 710-988-2254

BUFFALO WAREHOUSE

1051 CLINTON STREET, BUFFALO, N.Y. 14206, DIRECT LINE TO TORONTO PLANT (716) 854-6700, TWX 610-492-1373



McCurdy Radio Industries reserves the right, without notice to make such changes in equipment, design, specifications, or components as progress in engineering or manufacturing techniques may warrant to improve the performance of the product.

Section 1 GENERAL DESCRIPTION

- 1.01 The PS852 is a self-contained solid-state power supply designed primarily for use with the McCurdy line of intercommunication systems and other broadcasting equipment. This power supply provides regulated DC outputs of +15 volts and -15 volts at up to 3 amperes.
- 1.02 As supplied, the PS852 is wired for operation on 115V, 50/60Hz. However, it is possible to reconnect the input power transformer for operation on 230V, 50/60Hz if required. Refer to Section 5 for conversion details.
- 1.03 Any combination of amplifiers within a system may be operated from one PS852, as the low dynamic output impedance of the power supply minimizes cross-coupling.
- 1.04 Complete overload, short-circuit and fault protection is built into the PS852. The circuitry also provides current limiting for the DC outputs. Indicator lamps, mounted on the front panel, monitor the +15V and -15V outputs. For further details, refer to Section 3.
- 1.05 Silicon semiconductors are used in the PS852 for maximum reliability. The power supply is constructed on a rigid metal chassis and includes a protective cover. It is designed to plug into an FR906 Equipment Frame which can accommodate up to four PS852 power supplies. Adequate cooling is provided by means of convection and no additional external or internal cooling is required.
- 1.06 The regulator circuitry is constructed on a glass-epoxy printed circuit board which plugs into an edge connector mounted on the main power supply chassis.

Section 2 SPECIFICATIONS

- 2.01 Voltage:  
+15V and -15V DC, regulated.
- 2.02 Load Current:  
0 to 3 amps.
- 2.03 Regulation:  
a) Line: 0.5% for input voltages from 105 to 125V AC.  
b) Load: 0.5% for loads from 0 to 3 amps.
- 2.04 Ripple and Noise:  
Less than 500uV, RMS for line and load variations specified in 2.03.
- 2.05 Internal Impedance:  
Less than 0.1 ohm, DC to 20kHz.
- 2.06 Overload Protection:  
Internal current limiting at 3 amps. Short-circuit proof for infinite time.
- 2.07 Cooling:  
By convection. Power transistors mounted on large heatsinks.
- 2.08 Primary Power Requirements:  
a) Power transformer primaries in parallel, as supplied:  
105 to 125V, 115V AC nominal, 50/60Hz, 500VA maximum.  
b) Power transformer primaries in series:  
210 to 250V, 230V AC nominal, 50/60Hz, 500 VA maximum.
- 2.09 Ambient Temperature Range:  
0°C to 55°C, continuous duty cycle at full current.
- 2.10 Dimensions:  
4-1/2 in. (114mm) high, 4-1/4 in. (108mm) wide, 11-1/4 in. (286mm) long.  
NOTE: Length includes receptacle and control knobs.
- 2.11 Weight:  
12 lb. (5.4kg).

Section 3 INSTALLATION

- 3.01 On receipt of the PS852 power supply, examine the unit for any damage that may have occurred in transit. If any damage is found, report it immediately in accordance with the enclosed damage claim procedure form.
- 3.02 The PS852 is designed to plug into a McCurdy type FR906 equipment frame. This frame may be mounted in a standard 19-inch rack or pedestal and occupies 5- $\frac{1}{4}$  inches of vertical space. The FR906 frame will hold up to four PS852 power supplies.
- 3.03 A McCurdy type A852/5-3 connector mounting bracket is required to mount the Amphenol type 26-4104-24 'Blue Ribbon' connector in the FR906 frame. Mount the bracket on two 3/8 inch long spacers, McCurdy A-MRI-13-4, using size 4-40 hardware. To prevent hazardous exposure of AC voltages, mount a connector cover, McCurdy A852/5-4, over the wired connector.
- 3.04 To achieve maximum performance over extended periods of time, ensure that the PS852 is not required to supply more than 3 amperes. Also ensure that the ventilation holes in the mounting frame and the power supply cover are not obstructed, allowing maximum cooling air to flow through the power supply.
- 3.05 All connections to external equipment are made to frame receptacle J1 which mates with P1 on the power supply. (The frame receptacle may be stamped with a different designation for identification within a system.)  
IMPORTANT: Make all other connections first before connecting AC power. Refer to Figure 3-1 for pin connections.
- 3.06 DC Output Connections:  
The +15 volt regulated output is taken from J1 pin 20 and the -15 volt regulated output is taken from J1 pin 24. The common line for both voltages is connected to J1 pins 10 and 22.
- 3.07 Grounding:  
Chassis ground connects to J1 pin 1 and should be run to system ground via an insulated, stranded 12AWG wire.
- 3.08 AC Power Connections:  
As supplied, the PS852 is internally wired for a power input of 115V, 50/60Hz, single phase AC at 500 VA maximum. The AC input connects to J1 pin 14 and J1 pin 3 (neutral).

- 3.09 Indicators and Control Functions:  
On the front panel of the PS852 are two indicator lamps designated '+15V' and '-15V' for the two regulated outputs. Primary power is applied by means of the ON/OFF toggle switch.
- 3.10 Fuse Protection:  
On the front panel are three fuseholders; two are for 3A fuses protecting the +15V and -15V DC circuits, and one is a 1.25 ampere slo-blo fuse protecting the 115V AC input circuit.

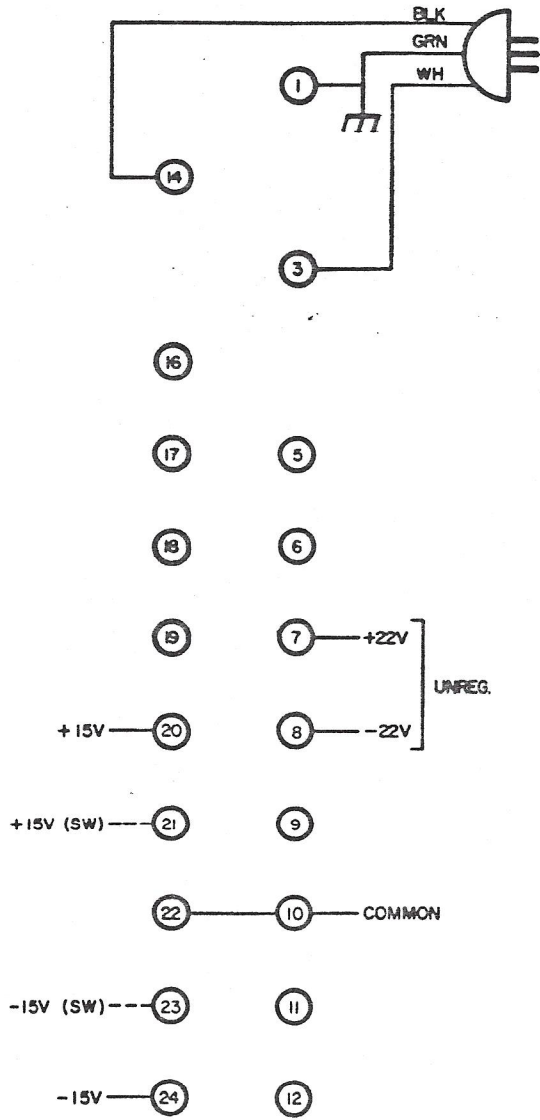


Figure 3-1: Connector Wiring

Section 4 CIRCUIT DESCRIPTION

- 4.01 The schematics of the PS852 and its regulator PC board are shown in Figures 4-1 and 4-2 respectively. Figure 5-2 shows the component locations on the regulator board. Refer to these figures for identification of components mentioned in the following description.
- 4.02 Low voltage AC from the secondaries of power transformer T1 is rectified by bridge rectifier KBH-02 and filtered by capacitors C3, C3A, C4 and C4A. A common centre-tap is provided on the transformer secondary winding.
- 4.03 The  $\pm 22$  volt unregulated DC output from the rectifier bridge is connected via 3 ampere fuses F1 and F2 to the regulator PC board. These fuses are of a special type with a controlled fusing characteristic.
- 4.04 The positive and negative voltage regulator circuits on the regulator PC board provide both regulation and additional filtering for the +15 volt and -15 volt outputs.
- 4.05 Integrated circuit IC1 functions as an error amplifier, providing a highly stable voltage output for driving DC amplifier transistors Q5 and Q1. For the +15 volt circuit, Q5 drives series pass transistor Q1 located on the main chassis. The corresponding drive for the -15 volt series pass transistor Q2 (also on the main chassis) is provided by transistor Q1 on the regulator board. The  $\pm 15$  volt reference voltage to IC1 and associated circuitry is taken from the output of the power supply.
- 4.06 **Current Limiting Circuit:**  
Current sensing and current limiting circuits are provided on the regulator PC board. In the positive voltage circuit, the increase in voltage developed across R1 with increasing output current triggers the current limiting circuit comprising Q3, Q4 and associated components. This circuit in turn develops the reference signal for the current limiting circuit within IC1. Resistor R2 and transistor Q2, together with transistor Q4, provide current sensing and limiting for the negative voltage circuit.
- 4.07 Transistor Q6 and associated components activate the current limiting circuit for the negative voltage circuitry when the positive line is short circuited to ground or excessively loaded. Potentiometer R15 allows the operating point of this circuit to be adjusted. It is factory preset and is normally adjusted only if a component has been changed on the PC board. Refer to Section 5 for adjustment procedure.

4.08 When regulated +15V is present at the output, front panel indicator lamp PL1, connected between the +15V line and common, is illuminated. Corresponding lamp PL2, connected between the -15V line and common, is illuminated when the -15V output is present.

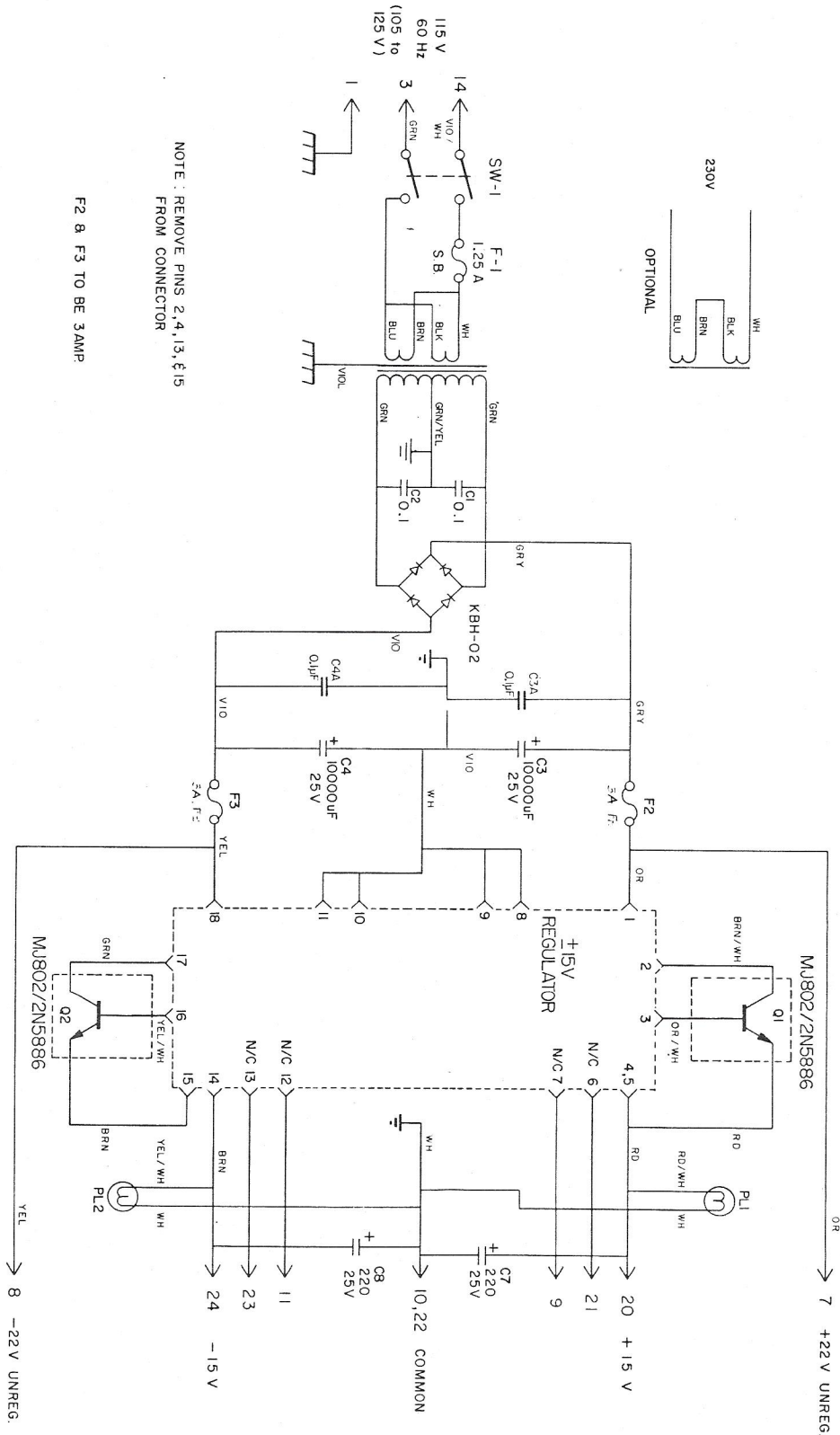
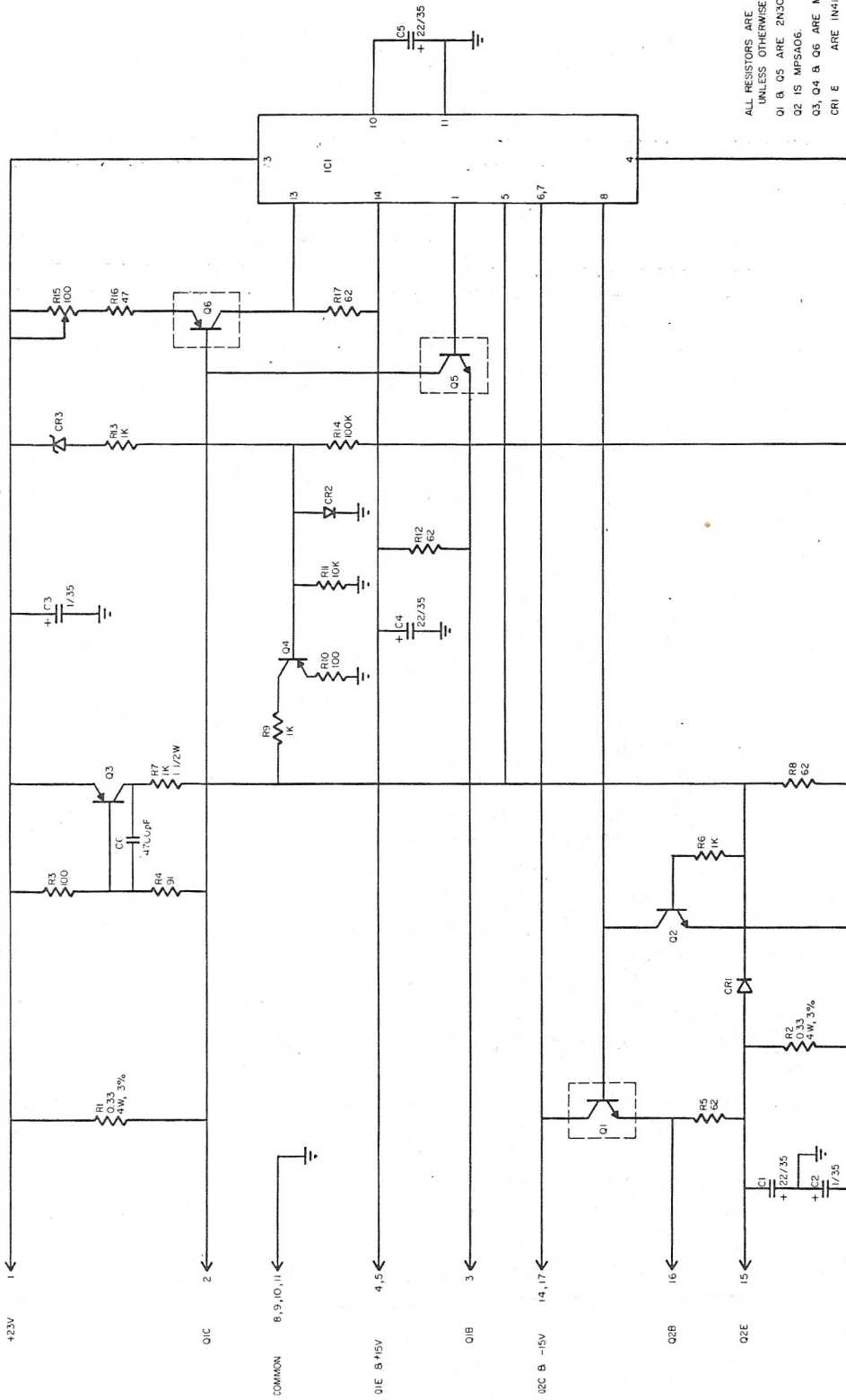


Figure 4-1: Schematic Diagram, PS852



ALL RESISTORS ARE 1/4W, 5%,  
UNLESS OTHERWISE SPECIFIED.  
Q1, Q5 ARE 2N3053.  
Q2 IS MPSA06.  
Q3, Q4, Q6 ARE MPSA56.  
CR1, E ARE IN4148.  
CR3 IS IN5246B.  
IC1 IS LM325N.

Figure 4-2: Schematic Diagram, PS852A Regulator



Section 5 MAINTENANCE

- 5.01 Inspect the power supply during regular system maintenance periods. Look for damaged or deteriorated components and check for loose connections and worn or damaged wiring. Remove accumulated dust by means of a soft brush or vacuum cleaner.
- 5.02 Remove the top cover by removing the four pan head screws securing the cover to the chassis. Do not remove the four flat head screws until the cover has been removed otherwise the chassis will be detached from the base plate while the cover is still in place. The regulator circuit is located on the plug-in PC board. Refer to Figure 5-2 for component location.  
WARNING! Hazardous voltages exist within the power supply when switched ON. Take care to avoid contact with these voltages when servicing.
- 5.03 When working on the printed circuit board, take care not to damage the board, etching or components. A 25 Watt temperature-controlled pencil-point soldering iron is recommended. Use only resin-cored solder.
- 5.04 When replacing an MJ802/2N5886 transistor, Q1 or Q2, mounted on the large heatsink, coat both sides of the insulating washer with a filled silicone grease such as Thermalloy 'Thermalcote'. This ensures efficient heat transfer from the transistor to the heatsink.  
CAUTION! Always shut off power, disconnect plug at rear, and wait one minute before removing PC board or any components. Do not apply power to the circuit with the PC board or any component removed.
- 5.05 If any component on the regulator PC board has been replaced, the output voltage must be rechecked as in 5.10, and R15 readjusted as in 5.9.
- 5.06 In the following test procedures and in the Test Set-up, Figure 5-1, it is presumed that the power transformer is wired for 115V operation as standardly supplied. If the strapping has been changed for 230V operation, ensure that the proper line voltage is applied to the unit.
- 5.07 The following equipment, or equivalent, is required for the subsequent tests.  
a) Variac: 115VAC input, 0 to 140V output, 50/60Hz, 3A.  
b) Multimeters (2 required): 20,000 ohms/volt, 0 to 25V DC scale and 5A DC scale: AVO model 8.

- 5.07
- c) AC Electronic Voltmeter: Fluke 8000A.
  - d) AC Voltmeter: 250V scale.
  - e) Rheostat (2 required): 20 ohm, 50W.
  - f) Resistor (2 required): 4 ohm, 50W.
  - g) Connector: Amphenol 26-190-16. This is required when bench testing unit.
- 5.08
- Negative Voltage Shutdown Test:  
Potentiometer R15 on the regulator PC board activates the negative shutdown circuitry, when the positive terminal is shorted to ground or common. This potentiometer should only be readjusted if a component on the PC board has been changed. Test as follows:
- a) Connect the AC inputs to the power supply as in Figure 5-1, but omit the resistor loads across the output terminals.
  - b) Adjust the variac for 115V.
  - c) Switch ON the power supply and note the DC outputs across pins 20 and 10 for +15V, and across pins 24 and 10 for -15V.
  - d) Connect a jumper between pin 20 and pin 10 to short circuit the +15V output.
  - e) Check that the -15V output across pin 24 and pin 10 or 22 collapses to 1.9V.
  - f) If the result is not as specified in Step 'e', adjust R15 as in 5.09.
  - g) Remove the jumper after completing the test.
- 5.09
- Adjustment of Potentiometer R15:  
If a component has been changed on the PC board or if the test results are not as specified in 5.08, adjust R15 as in the following steps. The adjustment must be made when the PS852 is 'cold' and with no load across the output terminals.
- a) Set potentiometer R15 to mid-position.
  - b) Connect a jumper across pins 20 (+15V) and 10 (common).
  - c) Switch ON the power supply and adjust R15 until the output across pins 24 (-15V) and 10 (common) collapses to 1.9 volts.
  - d) Connect the electronic voltmeter, set to the 2V range, across pins 1 and 2 of the PC board connector to measure the voltage across R1. The reading should not be higher than 1.14 volts (1.03 volts nominal). If it is higher, readjust R15 until it is reduced to 1.14 volts and then recheck for negative shutdown as in Step 'c'.
  - e) Remove the jumper connection across the +15V output.

- 5.10 Output Voltage Test:
- a) Connect the test equipment as in Figure 5-1, with the load resistors connected.
  - b) The voltmeters connected across the +15V and -15V outputs should be set to the 20V range.
  - c) Adjust the variac for an input of 115V AC and adjust the rheostats for maximum resistance.
  - d) Switch on the power supply and adjust the rheostats for an output current of 3A on both the positive and negative outputs. Observe the output voltage on the voltmeters, it should be between 15.08 and 14.93 volts. Both output indicator lamps should be lit.
  - e) The maximum allowable voltage differential between the pairs of output terminals is 200mV. If this value is exceeded, it indicates a fault in integrated circuit IC1.
- 5.11 Ripple and Regulation Tests:
- a) Set up the test equipment as shown in Figure 5-1.
  - b) Adjust the variac for 115V AC and set the test rheostats for maximum resistance.
  - c) Switch ON the power supply and note the DC output voltages and ripple level.
  - d) Adjust the rheostats for the 3 amp load current, then note the DC output voltages and ripple level.
  - e) Adjust the variac for 105V then 125V and note the DC output voltage and ripple each time. In both cases, the DC voltage should not vary more than 75mV and ripple should not exceed 500uV RMS.
- 5.12 This completes all test procedures.
- 5.13 Reconnection of Power Transformer for 230V Operation:
- a) Remove the four pan head screws securing the cover and place chassis on a clean work surface.
  - b) If access to fuse F1 or switch SW1 is difficult, remove the four screws securing the sub-chassis to the main chassis and move the sub-chassis sufficiently to gain access.
  - c) Remove the black wire from the ON terminal of SW1, leaving the blue wire in place.
  - d) Remove the brown wire from 1.25A fuse F1, leaving the white wire in place.
  - e) Twist the ends of the black and brown wires together, and solder.
  - f) Cover the bare end with sleeving and dress these wires under the fuseholder near the chassis, ensuring that there is no possible interference when the cover is installed.
  - g) Check for proper operation of the power supply.
  - h) Reinstall the cover.

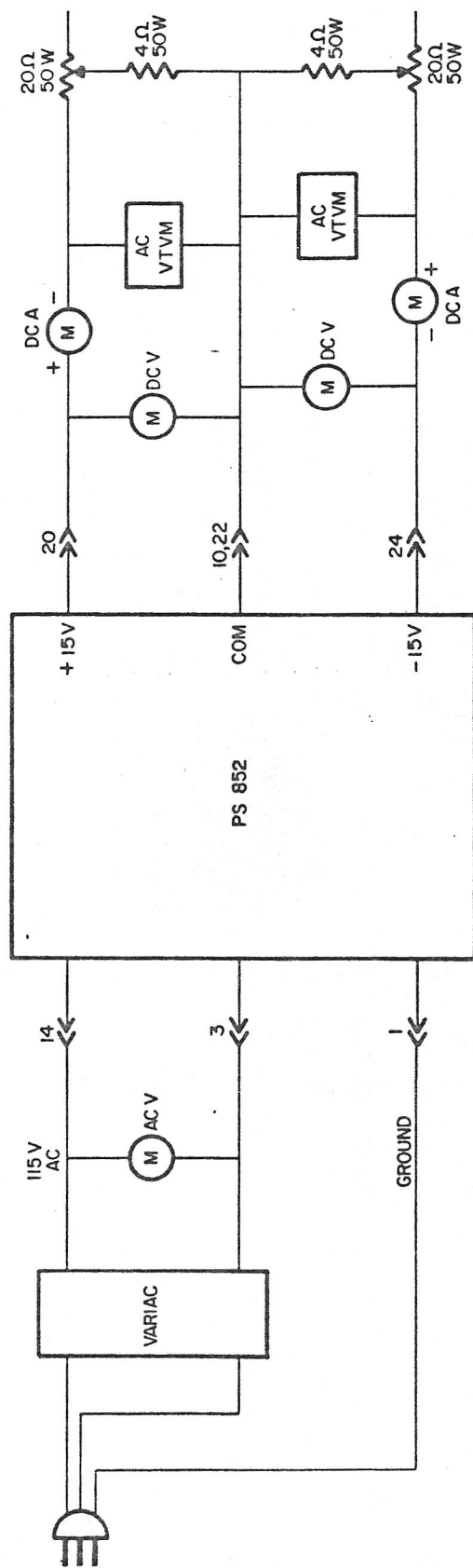
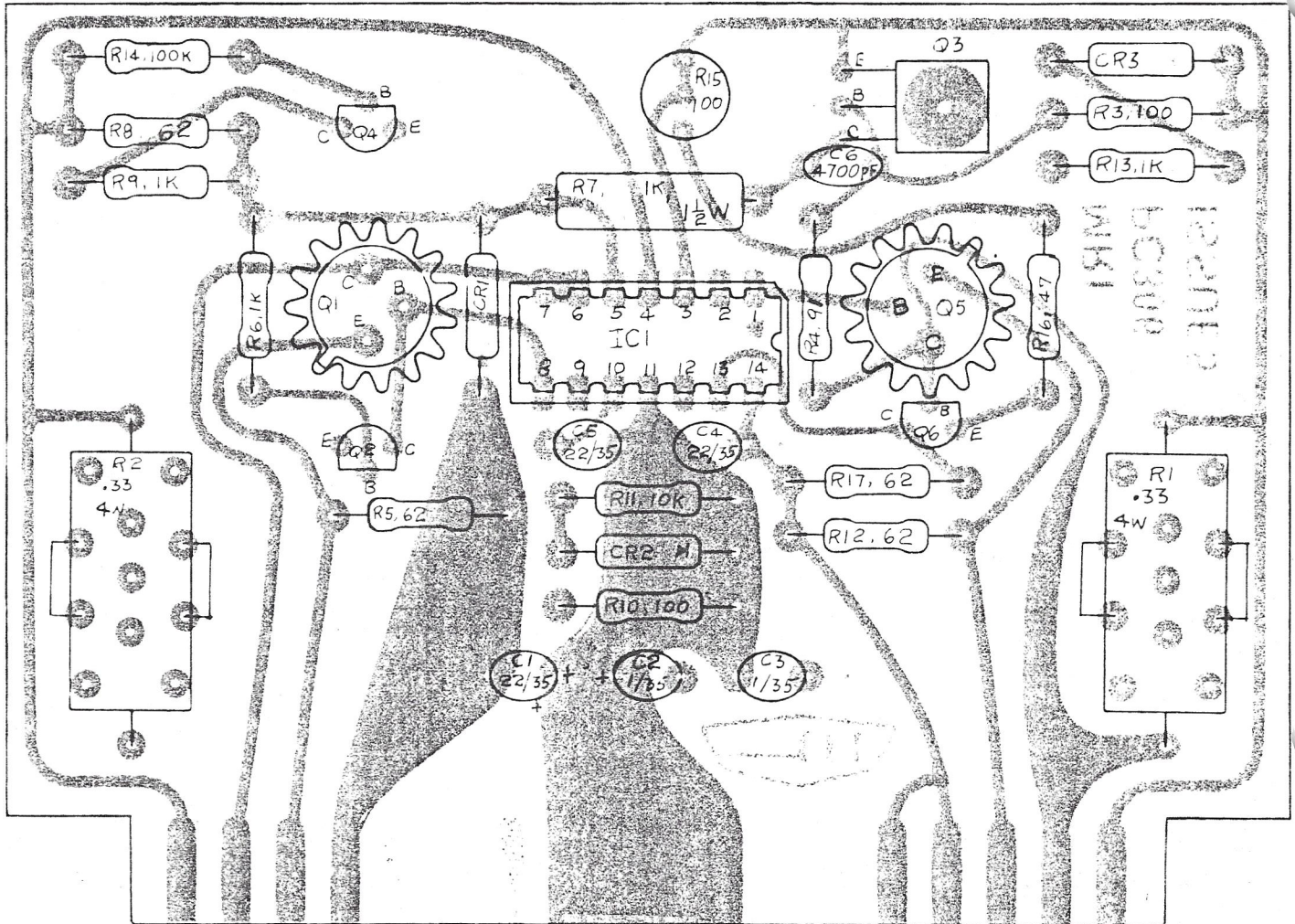


Figure 5-1: Test Setup



All resistors are  $\frac{1}{2}W$ ,  $\pm 5\%$ , unless otherwise specified.

- Q1 and Q5 are 2N3053
- Q2 is MPSA06
- Q3, Q4 and Q6 are MPSA56
- CR1 and CR2 are 1N4148
- CR3 is 1N5246B
- IC1 is LM325AN

Figure 5-2: Component layout, PS852A Regulator

## 6.01 List of Replaceable Parts, PS852 Main Chassis.

<u>REFERENCE DESIGNATION</u>	<u>SUPPLIER AND PART NUMBER</u>	<u>DESCRIPTION</u>
C1, C2, C3A, C4A	Siemens B32231	Capacitor, Mylar 0.1uf, 250V
C3, C4	Philips 431CRF4700+4700	Capacitor, Electrolytic 10,000uF, 25V
C7, C8	Siemens B41010	Capacitor, Electrolytic 220uF, 25V
----	Mallory VR3	Clamp, Capacitor Mounting (for C3, C4)
F1	Littelfuse 3131.25	Fuse, 1- $\frac{1}{2}$ A, Slo-Blo
F2, F3	Littelfuse 312003	Fuse, 3A
----	Littelfuse 342-004	Fuseholder
PL1, PL2	Eldema CR02WTB2102	Lamp, Incandescent, 18V
----	Eldema DH0-10B-D14B	Lampholder
Q1, Q2	Motorola MJ802 (alt. 2N5886)	Transistor, Silicon NPN
----	Cinch Jones 2TS-1	Socket, Transistor
----	Thermalloy B852/5-6	Heatsink
SW1	Carlingswitch 316B73	Switch, Power
T1	McCurdy 4017	Transformer, Power
----	Elco 00-6024-018-940-028	Connector, PC Edge
----	Amphenol 26-4101-24P	Connector, 24-pin
----	Cinch Jones T51	Terminal Strip
----	General Instruments KBH02	Bridge Rectifier
----	McCurdy PS852A-1	PC Board Assembly, Regulator

## 6.02 List of Replaceable Parts, PS852A-1 Regulator PC Board.

NOTE: As  $\frac{1}{4}$ W,  $\pm 5\%$  resistors are stock items, these are not listed.

<u>REFERENCE DESIGNATION</u>	<u>SUPPLIER AND PART NUMBER</u>	<u>DESCRIPTION</u>
C1, C4, C5	ITT TAG22M35	Capacitor, Tantalum 22uF, 35V
C2, C3	ITT TAG1M35	Capacitor, Tantalum 1uF, 35V
C6	Philips 2222 630 03472	Capacitor, Ceramic, Disc. 4700pF
CR1, CR2	Philips 1N4148	Diode, Silicon
CR3	Motorola 1N5246B	Diode, Zener, 16V
IC1	National LM325AN (alt. LM325N)	Integrated Circuit
----	Texas Instruments 831402	Socket, Integrated Circuit 14-pin
Q1, Q5	RCA 2N3053	Transistor, Silicon NPN
Q2	Motorola MPSA06	Transistor, Silicon NPN
Q3, Q4, Q6	Motorola MPSA56	Transistor, Silicon PNP
----	Thermalloy 2257	Heatsink
----	Thermalloy 7717-123	Transition Pad
R1, R2	Dale RS2-3-33	Resistor, Fixed, 0.33 ohms $\pm 3\%$ , 4W
R7	Ohmite 4123	Resistor, Fixed, 1000 ohms $\pm 5\%$ , 1.5W
R15	Beckman 91AR100	Potentiometer, 100 ohms
----	Littelfuse 102069	Clip, Mounting (for R1, R2)

PRELIMINARY

INSTRUCTIONS  
CS9000-5  
VOLTAGE REGULATOR

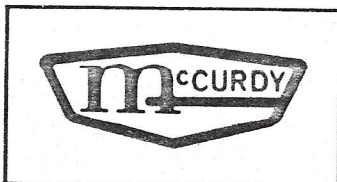
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Component Layout	B-9000-5/8-1
Connector Wiring	A-9000-5/8-2

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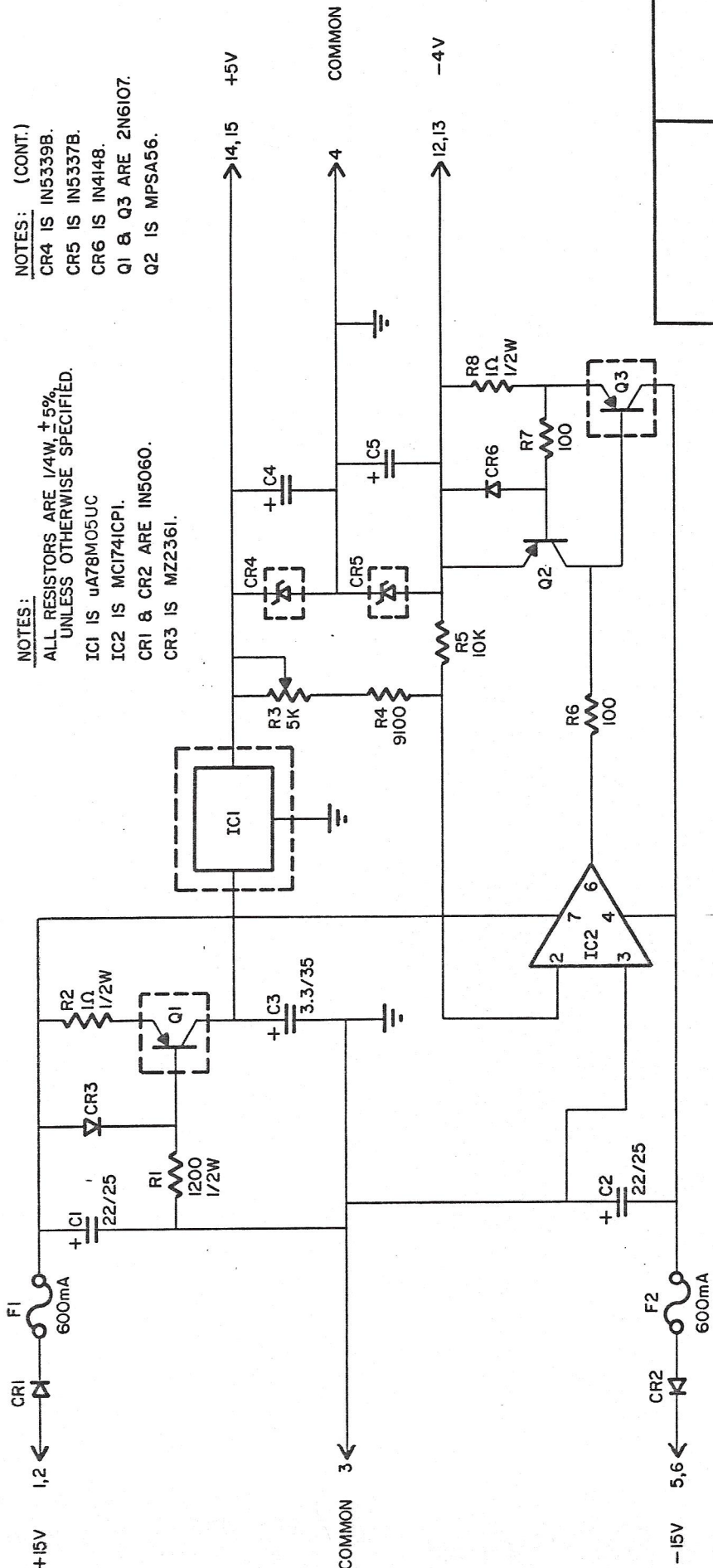
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NOTES: (CONT.)  
 CR4 IS IN5339B.  
 CR5 IS IN5337B.  
 CR6 IS IN4148.  
 Q1 & Q3 ARE 2N6107.  
 Q2 IS MP5A56.

NOTES:  
 ALL RESISTORS ARE 1/4W, ±5%,  
 UNLESS OTHERWISE SPECIFIED.  
 IC1 IS uA78M05UC  
 IC2 IS MC1741CPI.  
 CR1 & CR2 ARE IN5060.  
 CR3 IS MZ2361.

**McCurdy Radio Industries**

**CS 9000-5**

VOLTAGE REGULATOR  
SCHEMATIC

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DATE- DEC 22/76

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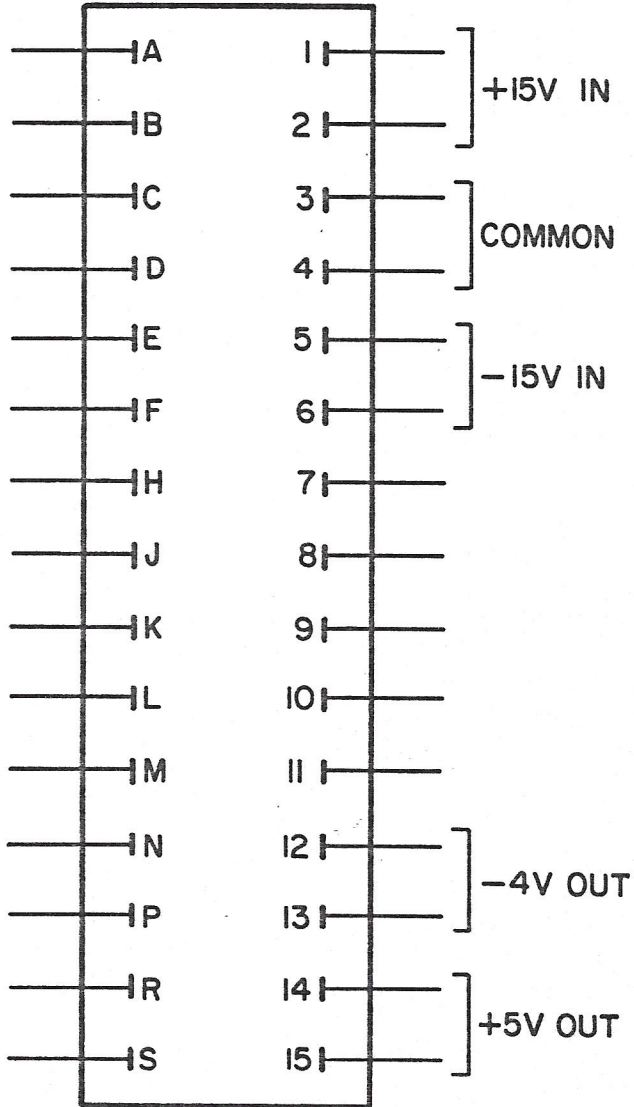
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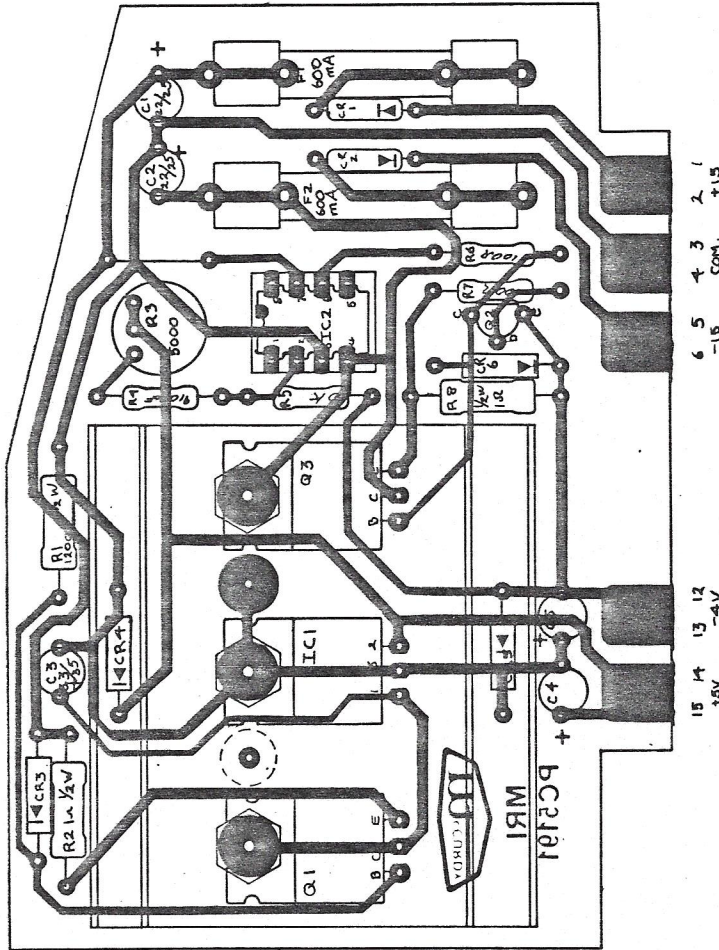
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NOTES  
 ALL RESISTORS ARE 1/4W ±5%,  
 UNLESS OTHERWISE SPECIFIED.  
 IC1 IS A 78M05 UC  
 IC2 IS MC1741CPI.  
 CR1 & CR2 ARE 1N5060.  
 CR3 IS MZ2361.  
 CR4 IS 1N5339B.  
 CR5 IS 1N5337B.  
 CR6 IS 1N4148.  
 Q1 & Q3 ARE 2N6107.  
 Q2 IS MPSA56.



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