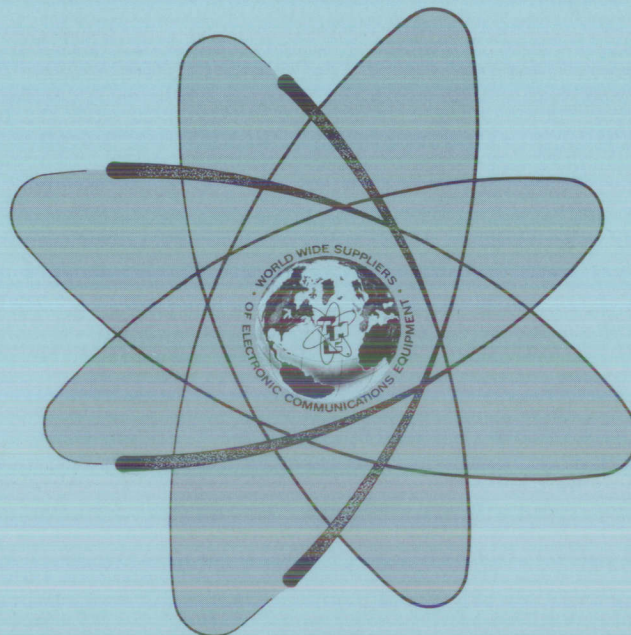


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TECHNICAL MANUAL  
for  
RADIO RECEIVING SET  
MODEL DDR-10

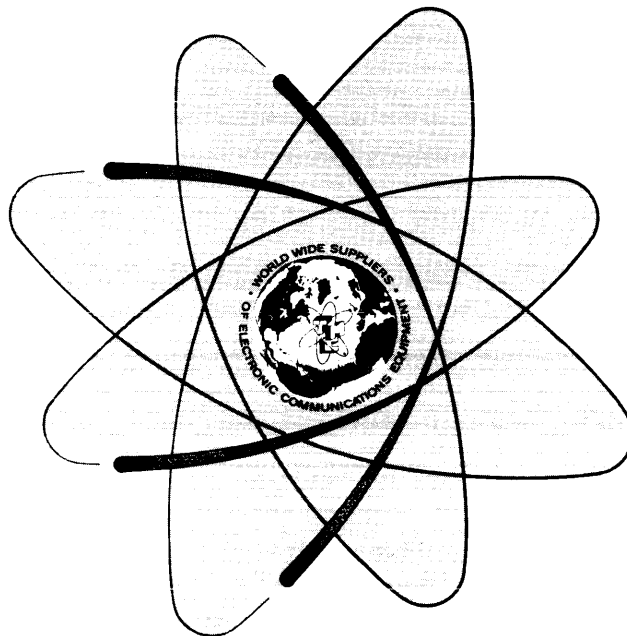


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TECHNICAL MANUAL  
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MODEL DDR-10



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## NOTICE

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# THE TECHNICAL MATERIEL CORPORATION

COMMUNICATIONS ENGINEERS

700 FENIMORE ROAD

MAMARONECK, N. Y.

## Warranty

The Technical Materiel Corporation, hereinafter referred to as TMC, warrants the equipment (except electron tubes, \*fuses, lamps, batteries and articles made of glass or other fragile or other expendable materials) purchased hereunder to be free from defect in materials and workmanship under normal use and service, when used for the purposes for which the same is designed, for a period of one year from the date of delivery F.O.B. factory. TMC further warrants that the equipment will perform in a manner equal to or better than published technical specifications as amended by any additions or corrections thereto accompanying the formal equipment offer.

TMC will replace or repair any such defective items, F.O.B. factory, which may fail within the stated warranty period, PROVIDED:

1. That any claim of defect under this warranty is made within sixty (60) days after discovery thereof and that inspection by TMC, if required, indicates the validity of such claim to TMC's satisfaction.
2. That the defect is not the result of damage incurred in shipment from or to the factory.
3. That the equipment has not been altered in any way either as to design or use whether by replacement parts not supplied or approved by TMC, or otherwise.
4. That any equipment or accessories furnished but not manufactured by TMC, or not of TMC design shall be subject only to such adjustments as TMC may obtain from the supplier thereof.

Electron tubes furnished by TMC, but manufactured by others, bear only the warranty given by such other manufacturers. Electron tube warranty claims should be made directly to the manufacturer of such tubes.

TMC's obligation under this warranty is limited to the repair or replacement of defective parts with the exceptions noted above.

At TMC's option any defective part or equipment which fails within the warranty period shall be returned to TMC's factory for inspection, properly packed with shipping charges prepaid. No parts or equipment shall be returned to TMC, unless a return authorization is issued by TMC.

No warranties, express or implied, other than those specifically set forth herein shall be applicable to any equipment manufactured or furnished by TMC and the foregoing warranty shall constitute the Buyers sole right and remedy. In no event does TMC assume any liability for consequential damages, or for loss, damage or expense directly or indirectly arising from the use of TMC Products, or any inability to use them either separately or in combination with other equipment or materials or from any other cause.

\*Electron tubes also include semi-conductor devices.

### *PROCEDURE FOR RETURN OF MATERIAL OR EQUIPMENT*

Should it be necessary to return equipment or material for repair or replacement, whether within warranty or otherwise, a return authorization must be obtained from TMC prior to shipment. The request for return authorization should include the following information:

1. Model Number of Equipment.
2. Serial Number of Equipment.
3. TMC Part Number.
4. Nature of defect or cause of failure.
5. The contract or purchase order under which equipment was delivered.

### *PROCEDURE FOR ORDERING REPLACEMENT PARTS*

When ordering replacement parts, the following information must be included in the order as applicable:

1. Quantity Required.
2. TMC Part Number.
3. Equipment in which used by TMC or Military Model Number.
4. Brief Description of the Item.
5. The *Crystal Frequency* if the order includes crystals.

### *PROCEDURE IN THE EVENT OF DAMAGE INCURRED IN SHIPMENT*

TMC's Warranty specifically excludes damage incurred in shipment to or from the factory. In the event equipment is received in damaged condition, the carrier should be notified immediately. Claims for such damage should be filed with the carrier involved and not with TMC.

All correspondence pertaining to Warranty Claims, return, repair, or replacement and all material or equipment returned for repair or replacement, within Warranty or otherwise, should be addressed as follows:

THE TECHNICAL MATERIEL CORPORATION  
Engineering Services Department  
700 Fenimore Road  
Mamaroneck, New York

RADIO RECEIVING SET  
MODEL DDR-10

A-1. Introduction

The DDR-10 Radio Receiving Set is similar to the military nomenclature Radio Receiving Set AN/URR-64(V)3. The Technical Manual (Volumes 1 and 2) and Operators Handbook for Radio Receiving Sets AN/URR-64(V)1,2 and 3 will apply to the DDR-10, when the additions, deletions and corrections outlined in this addendum have been incorporated.

The differences between the DDR-10 and the AN/URR-64(V)3 fall into several specific categories, and each category is covered separately in this addendum. Under each category, a general description of the change is given, followed by a discussion of the effect of the change on specific sections of the technical manual. Additionally, engineering drawings are provided with this addendum as replacements, where required.

A-2. Nomenclature

The units which comprise the AN/URR-64(V)3 are referred to in the technical manual by using military nomenclature. The DDR-10 receiver is comprised of identical units, but the units should be referenced by commercial nomenclature.

- a. Change all military nomenclature references to commercial nomenclature as listed below:

<u>Unit</u>	<u>Military Nomenclature</u>	<u>Commercial Nomenclature</u>
RF Tuner	TN-512/URR	HFR-4
Demultiplexer	TD-915/URR	MSA-4
Reference Signal Generator	O-1511/URR	HFS-4

A-3. Equipment Configuration

Although the individual units of the DDR-10 are the same as the AN/URR-64(V)3 (shown in figure 1-3), the units are configured in a different manner. Additionally, the DDR-10 receiver is equipped with the Frequency Shift Converter, Model CFA-2, which is housed in the DDR-10 rack.

- a. Disregard figures 1-3 and 2-3 and refer to the line drawing provided with this addendum (figure 1).
- b. Replace figure 2-6 with the new outline and dimension drawing supplied with this addendum.

- c. Replace Table 2-3 with the new summary list of installation material supplied with this addendum.
- d. Replace Table 2-6 with the new wire run list provided with this addendum.
- e. Replace figure 5-3 with the new rack cabling drawing provided with this addendum.

#### A-4. Modes of Operation

The DDR-10 differs from the AN/URR-64 in that it does not have AFC or 4-channel ISB operation. However, the DDR-10 has the full capability of FSK reception since it includes its own terminal equipment (the addition of Frequency Shift Converter, Model CFA-2).

- a. In Section 1 disregard any reference to or discussion of AFC and 4-channel ISB operation. On Table 1-1 delete references to channels A2 and B2, to AFC, and to Envelope Delay.
- b. In paragraph 4-2b, SIGNAL DETECTION SECTION, change last sentence to read: "Audio appears at the output in the form of a symmetrical channel for AM or CW, or up to two demultiplexed channels (B1 and A1) in a 2-channel sideband transmission."  
On figure 4-1 delete references made to channels A2 and B2.
- c. Delete in entirety paragraph 4-2g, AFC SECTION, and on figure 4-1 delete the block marked AFC SECTION.  
On Table 4-1, delete references to AFC Section.
- d. In paragraph 4-3c, SIGNAL DETECTION SECTION change any references to ISB from 4-channel to 2-channel, and delete any references to channels A2 and B2.  
On figure 4-2, any references to the outboard channels A2 and B2 circuitry should be disregarded, i.e. 2A7, 2A13, 2A6, 2A12, 2R2, 2R5. Disregard the circuitry on 2A3 which provides the injection frequencies for the outboard channels (243.71 and 256.29 kc).
- e. In paragraph 4-3d, GAIN CONTROL SECTION, delete the last sentence, "The AFC CARRIER switch position monitors the level of carrier component in AFC operation (see paragraph 4-3h, AFC Section)." On figure 4-4 (sheet 1) delete reference to "CARRIER LEVEL FROM AFC (FIGURE 4-10)." On figure 4-2 (sheet 2) delete all references to outboard channel circuitry, i.e. 2A7, 2A13, 2A15, 2A18, 2S9, 2S12.
- f. Delete in entirety para 4-3h, AFC SECTION.  
Delete in entirety figure 4-10, Servicing Block Diagram, AFC Section.
- g. Delete in entirety para 4-5g, 1A3 AFC.  
Delete in entirety figures 5-22 and 5-23 on 1A3 AFC.



- h. Replace para 4-6c, with the following:

"c. 2A3 SUBCARRIER GENERATOR.

(1) CIRCUIT DESCRIPTION. (see figure 5-55.)

a. SIGNAL DETECTION SECTION. - In the DDR-10 all the circuitry in 2A3 is utilized in the receiver's signal detection section (see figure 4-2 and para 4-3c).

The 1 mc basic reference signal enters at pin 4 and is amplified by transistors Q1 and Q2. The amplified 1 mc signal is routed to both Z1 and Z6. In the DDR-10 receiver the 100:1 divider section is not utilized and the Z1 and Z2 components are not supplied on 2A3, rendering the circuitry following that divider section inoperative. The 1 mc signal, however, is divided by 4 in Z6, and the resultant 250 kc signal is amplified separately by Q9 and Q10 and brought out at pins 8 and L of 2A3 to be used in the receiver's A1 and B1 product detectors. The signal is also applied via Q11 and Q12 to the emitters of Q13 and Q14. The circuitry following Q13 and Q14 however, is rendered inoperative, since the filters FL1 and FL2 are not supplied on 2A3 in the DDR-10. (This circuitry normally would provide the injection frequencies for the outboard channel product detectors)."

On figure 5-55 disregard the circuit components and signal flow from Z1 on. The only circuitry on 2A3 which is utilized in the DDR-10 is the circuitry involved in the following signal flow path: Pin 4, Q1, Q2, Q6, Z6, Q9, Q10, with outputs on pins 8 and L.

- i. In paragraph 4-6f, change the title from "2A6 8,10,12 AUDIO/DEMOMULATORS, ISB" to "2A6, 8 and 10 AUDIO/DEMOMULATORS, ISB." In the DDR-10, since there are no outboard channels A2 and B2, the product detector discussed in para 4-6f(1)(a) is only utilized on 2A8 and 2A10. The audio amplification section is utilized on all boards (2A6, 2A8, 2A10); however, this section on A26 is utilized only for amplification of symmetrical audio. Disregard any references in para 4-6f(1)(a) to outboard channels A2 and B2.

On figure 5-61 change the title from "Schematic Wiring, Audio Demodulator, ISB, 2A6, 2A8, 2A10, 2A12" to "Schematic Wiring, Audio Demodulator, ISB, 2A6, 2A8, 2A10". Also, note on figure 5-61 that on the 2A6 card the product detector section (pin 12 input to pin R output) is not used.

- j. In paragraph 4-6g, change title from "2A7, 2A9, 2A11, 2A13, IF/AGC, ISB" to "2A9 and 2A11, IF/AGC, ISB."  
Replace para 4-6g(1)(a) with the following:

"g. 2A9 and 2A11, IF/AGC, ISB.

(1) CIRCUIT DESCRIPTION. (see figure 5-55.)

a. SIGNAL DETECTION SECTION. - The greater part of the circuitry is used in the receiver's signal detection (See figure 4-2 and para 4-3c). The 250 kc carrier and sidebands enter at pin 14 and are amplified thru Q1. FL1 is a crystal sideband 3 kc channel filter and differs in the center frequency in 2A9 and 2A11. The band for 2A9 is centered at 248.355 kc, and for 2A11 at 251.645 kc. The selected channel frequencies are amplified through Q2. In the DDR-10 the delay equalizer FL2 is not installed (refer



to note 3 of figure 5-63). The signal is coupled to the IF amplifier chain, consisting of Q3, Q4, Q5, Q6, Q8, Q9, Q10 and Q11. Output is at pin 6, a monitor output is taken out of pin 4."

On figure 5-63, change title from "Schematic Wiring, IF/AGC, ISB 2A7, 9, 11, 13" to "Schematic Wiring, IF/AGC, ISB 2A9 and 2A11".

- k. In Section 5, Maintenance the following should be noted:
1. There is no AFC card 1A3 and its alignment may be disregarded (para 5-15).
  2. The subcarrier generator card 2A3 is only utilized to provide injection frequencies for the inboard channels (A1 and B1). In the alignment procedures for 2A3 (para 5-19) disregard steps 5,6,7,13,14.
  3. There are no outboard channel ISB, IF cards (2A7, 2A13). Perform the test outlined in para 5-20 only for the 2A9 and 2A11 cards.
  4. There is no ISB audio card 2A12 and only a portion of the circuitry is utilized on 2A6. Perform the full alignment outlined in para 5-22 for the 2A8 and 2A10 cards. For the 2A6 card disregard alignment in the product detector section and select a symmetrical mode, rather than ISB for alignment of the audio amplifier section.

- l. In Section 6, Parts List, disregard any references to circuitry not used in the DDR-10: all of 1A3, part of 2A3, all of 2A7, 2A12, 2A13, part of 2A6.

Change the 2A9FL1 part number from FX260 to FX291 and delete 2A9FL2. Change 2A11FL1 from FX263 to FX296. Delete 2A11FL2.

- m. In Section 3, Operators Handbook delete any references to AFC operation, and change any references to 4-channel ISB to 2-channel ISB.

With reference to outboard channel (A2, B2) operating controls, which appear on the MSA-4 unit, note that all controls for channel A2 are inoperative and that the SYM-B2 channel controls are operative only in the symmetrical modes.

#### A-5. Input Attenuator

The DDR-10 Receiving set differs from the AN/URR-64(V)3 Receiving Set in that it contains a different input attenuator assembly (1A11).

- a. Replace figure 5-34 with the new schematic wiring for 1A11 provided with this addendum.
- b. Replace figure 5-91 with the new exploded view provided with this addendum.
- c. Disregard the box A11 on figure 5-7; A11 is located within the chassis in the DDR-10.
- d. Delete in entirety para 5-39(c)(7) and replace with the following:  
"(7) REMOVAL OF 1A11 ANTENNA/FILTER ASSEMBLY (See figure 5-91 (4)).
  - a. First carry out the steps required for removal of filter board 1A13.
  - b. Carefully mark and unsolder 4 coaxial cables leading from 1A11 filter to the antenna inputs on the Tuner circuit boards.
  - c. Remove the two cable clamps on the bottom, rear, of the unit (under the removable PC board compartment). This step will allow cable slack when rear apron is removed. Refer to figure 5-91 (3).

- d. Remove three screws in a line on rear apron, at the extreme left side of the unit.
- e. Remove two screws on rear apron which hold the rear apron to the wall holding the side of the RF oscillator assembly opposite the right side. (Parts C of Figure 5-91 (2)).
- f. Remove four screws on the rear apron, holding the four corners of antenna/filter box 1A11. (Parts B of Figure 5-91 (2)).
- g. Lift the 1A11 assembly away (as far as possible) from rear apron.
- h. Carefully mark and unsolder the antenna input lead from the terminal in the 1A11 box. Do not unsolder at J-1. Refer to Figure 5-91 (4).
- i. Carefully mark and unsolder the following connections on 1A11:
  - C8 (RED)
  - C7 (BLUE-WHITE)
  - C6 (BROWN-WHITE)
  - C5 (GREY)
  - C4 (VIOLET)
  - C3 (RED-WHITE)
  - C2 (BLUE-WHITE)
  - C1 (BLUE)
- j. Remove 1A11 assembly.
- k. Reassemble in reverse order.

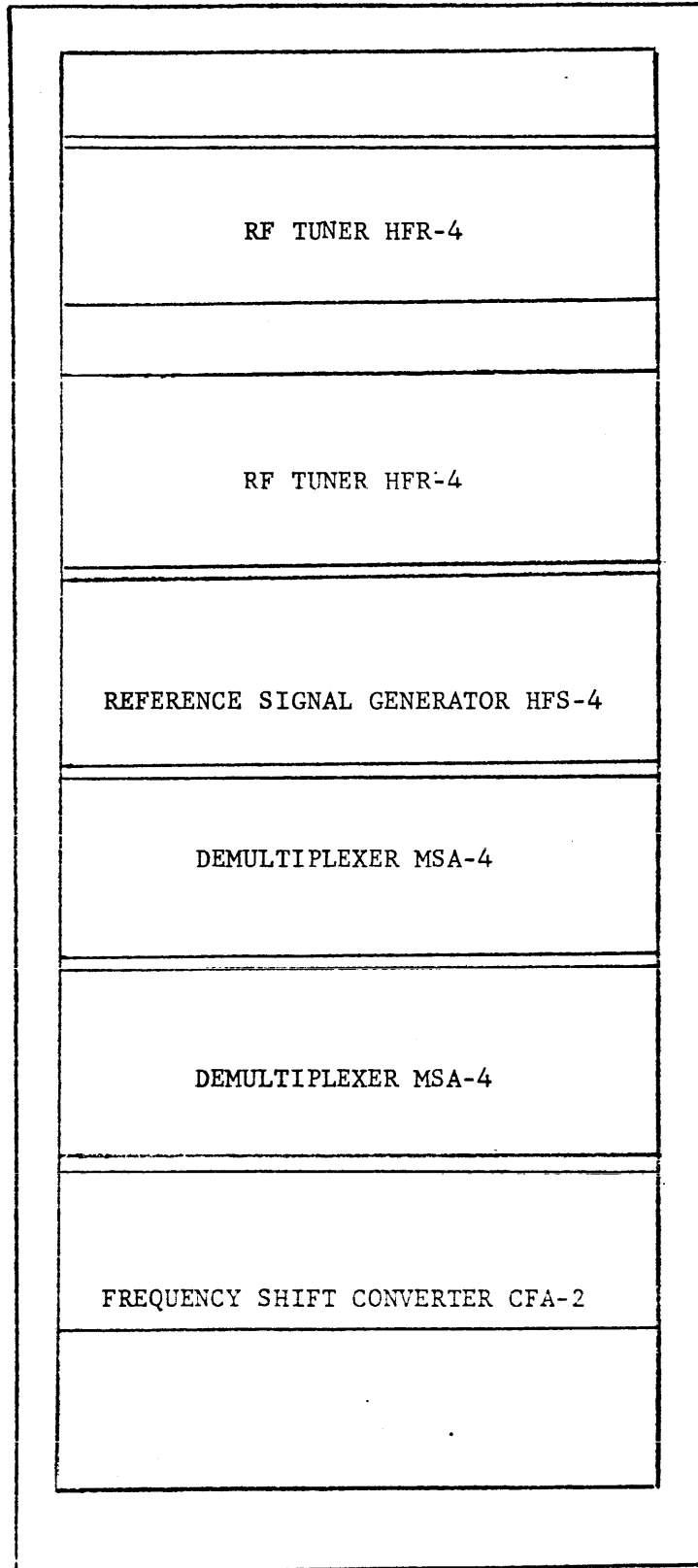


Figure 1. Equipment Configuration, DDR-10.

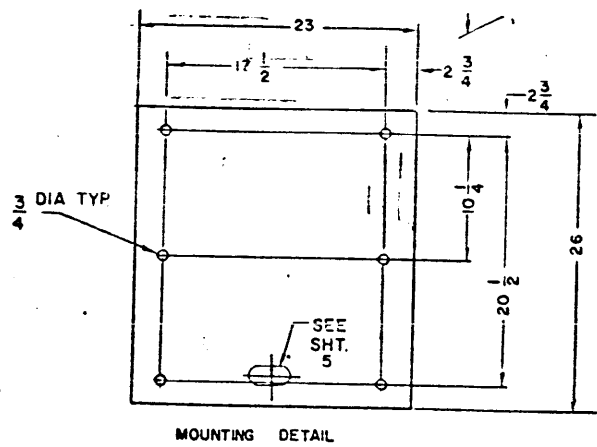
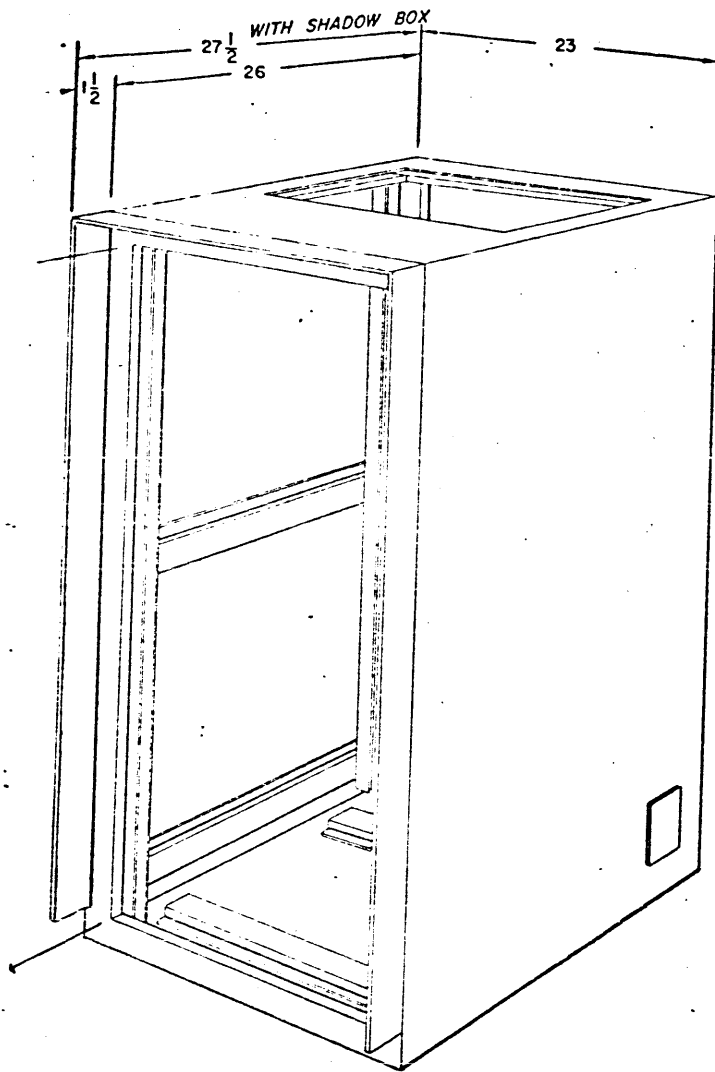


Figure 2-6. Outline and Dimensions, DDR-10 Rack

LOOSE ITEMS SUPPLIED

QTY	NOMENCLATURE	PART TYPE OR MODEL NO.	REMARKS
1	AC POWER PLUG		AC POWER INPJT
2	CONNECTOR, PLUG COAXIAL	UG-536*/U	MATES WITH 6W1J8 & 6W4J7
3	CONNECTOR, PLUG COAXIAL	UG-88C	MATES WITH 6W1J10
2	Connector, PLUG TELEPHONE	PJ055	FOR HEADSET (OPTIONAL) MATES WITH 2J20 "PHONE" JACKS.

Table 2-3. Summary List of Installation Material, DDR-10

CABLE TYPE & SIZE	NO. OF ACTIVE CONDS	COLOR CODE	FROM	TERMINAL BOARD PLUG OR JACK
RG213/U	1		INTERFACE PANEL RCVR "A"	6W1J8 "ANTENNA"
RG213/U	1		INTERFACE PANEL RCVR "B"	6W5J8 "ANTENNA"
	8		INTERFACE PANEL RCVR "A"	6W1J7 "AUDIO"
	8		INTERFACE PANEL, RCVR "B"	6W5J7 "AUDIO"
	2		INTERFACE PANEL, RCVR "B"	6W3J5 "SPEAKER"
RG 58/U	1		INTERFACE PANEL, RCVR "A"	6W1J9 "1Mc EXT STD"
	2		INTERFACE PANEL, RCVR "A"	6W1J5 "SPEAKER"
			CFA-2 TB-1 (1 TO 12)	
			TB-1 1,2,3	
			TB-1 4,5,6	

LEGEND FOR REFERENCE DESIGNATIONS

<u>6</u>	<u>W1</u>	<u>J5</u>
UNIT	CABLE	JACK

FROM	TERMINAL BOARD PLUG OR JACK	TERMINAL OR PIN DESIGNATION	TO	TERMINAL BOARD PLUG OR JACK	TERMINAL OR PIN DESIGNATION	FUNCTION
INTERFACE PANEL RCVR "A"	6W1J8 "ANTENNA"		ANTENNA, RCVR "A"			ANTENNA INPUT RCVR "A"
INTERFACE PANEL RCVR "B"	6W5J8 "ANTENNA"		ANTENNA, RCVR "B"			ANTENNA INPUT RCVR "B"
INTERFACE PANEL RCVR "A"	6W1J7 "AUDIO"	A B C  E F G H  K L M N  W X Y Z	AUDIO LINES RCVR "A"  } SYM/B2 CH LINE  } B1 CH LINE  } A1 CH LINE  } A2 CH LINE			4-CHANNEL AUDIO OUTPUT; RCVR "A" 600Ω CT } 600Ω GND } SYM/B2 600Ω CT } 600Ω GND } B1 600Ω CT } 600Ω GND } A1 600Ω CT } 600Ω GND } A2
INTERFACE PANEL, RCVR "B"	6W5J7 "AUDIO"	A B C  E F G H  K L M N  W X Y Z	AUDIO LINES RCVR "B"  } SYM/B2 CH LINE  } B1 CH LINE  } A1 CH LINE  } A2 CH LINE			4-CHANNEL AUDIO OUTPUT; RCVR "B" 600Ω CT } 600Ω GND } SYM/B2 600Ω CT } 600Ω GND } B1 600Ω CT } 600Ω GND } A1 600Ω CT } 600Ω GND } A2
INTERFACE PANEL, RCVR "B"	6W3J5 "SPEAKER"	1 } HSS 2 } A B C	SPEAKER, RCVR "B"  & HSS			MONITOR SPEAKER OUTPUT, RCVR "B" AUDIO PAIR SHLD GND
INTERFACE PANEL, RCVR "A"	6W1J9 "1Mc EXT STD"		EXT 1Mc SOURCE			1Mc STD EXTERNAL INPUT
INTERFACE PANEL, RCVR "A"	6W1J5 "SPEAKER"	1 } HSS 2 } A B C	SPEAKER RCVR "A"  & HSS			MONITOR SPEAKER OUTPUT, RCVR "A" AUDIO PAIR SHLD GND
CFA-2 TB-1 (1 TO 12)			TB-1 (1 TO 12) INTERFACE PANEL #2			SYM OPERATION FSK
TB-1 1,2,3			INTERFACE PANEL #1 J7 A,B,C			
TB-1 4,5,6			INTERFACE PANEL #2 J7 A,B,C			

OR REFERENCE DESIGNATIONS

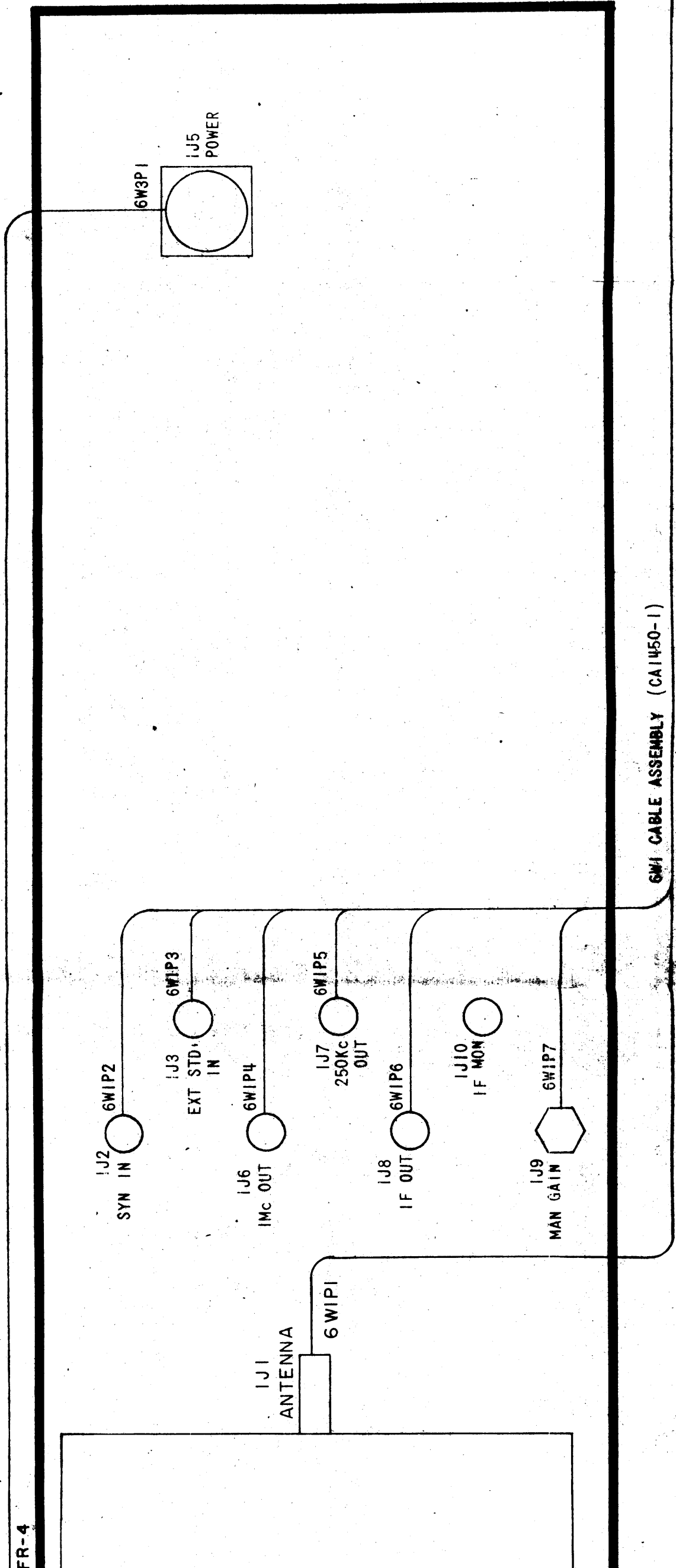
6 UNIT    W1 CABLE    J5 JACK

TABLE 2-6  
WIRE RUN LIST

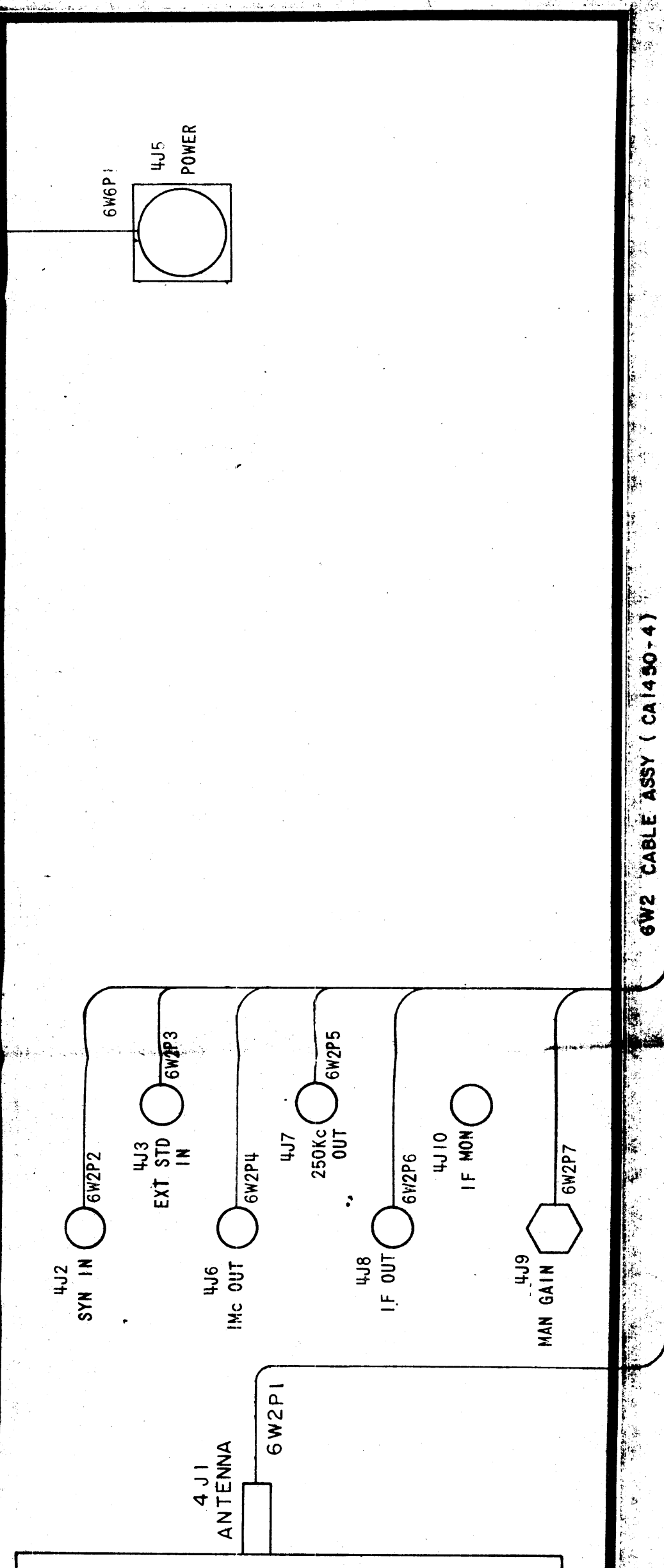


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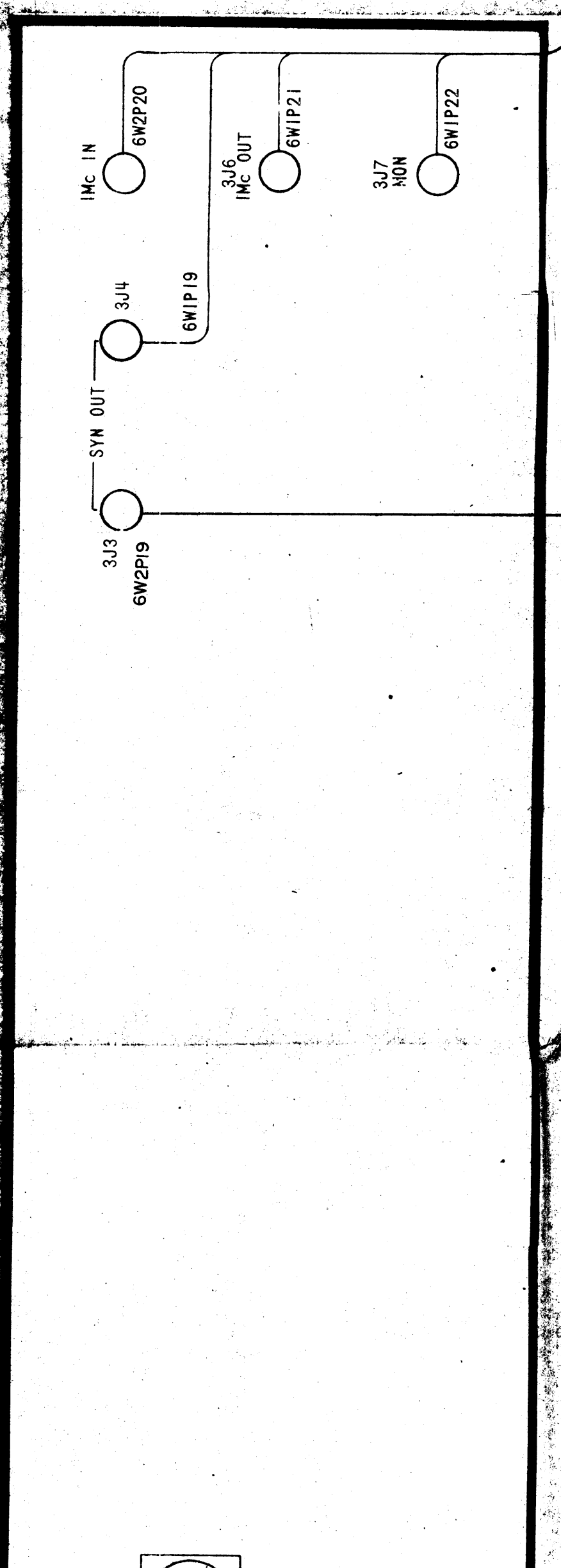
FR-4

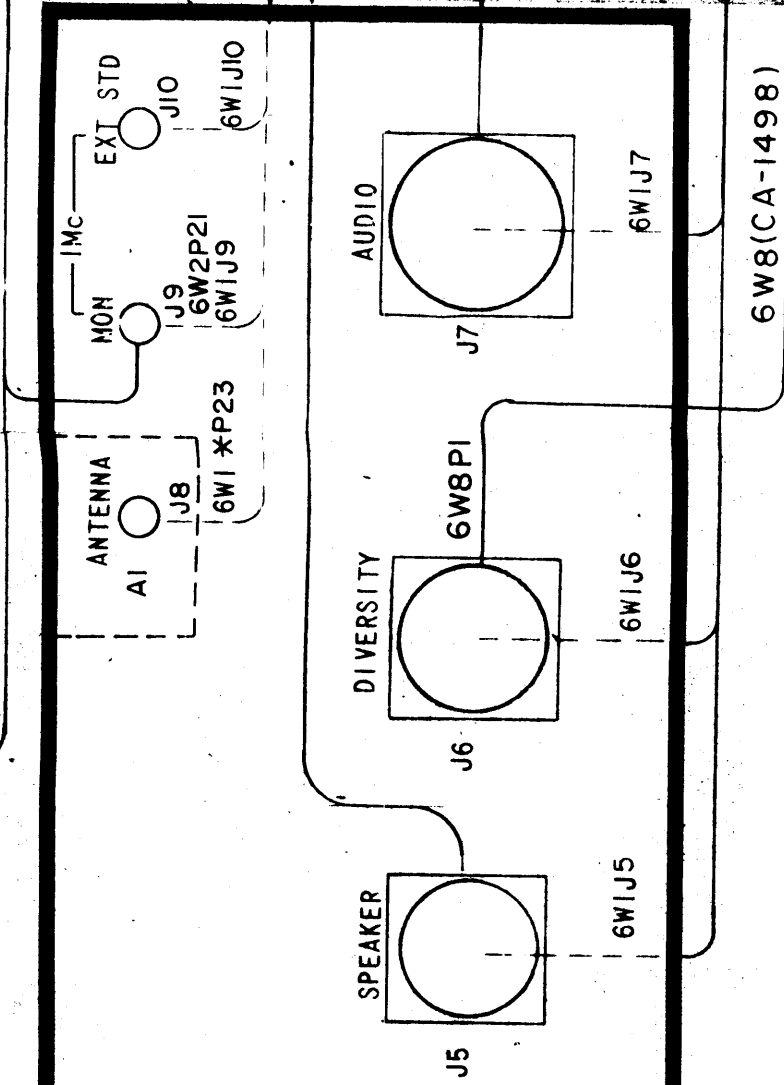


4J2



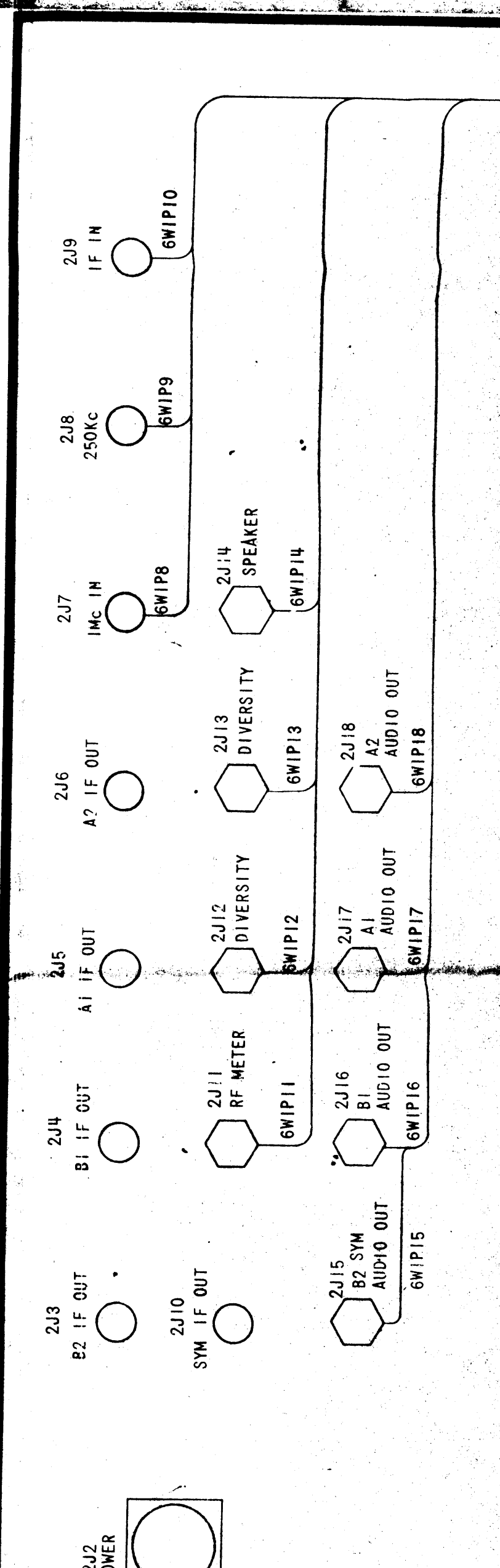
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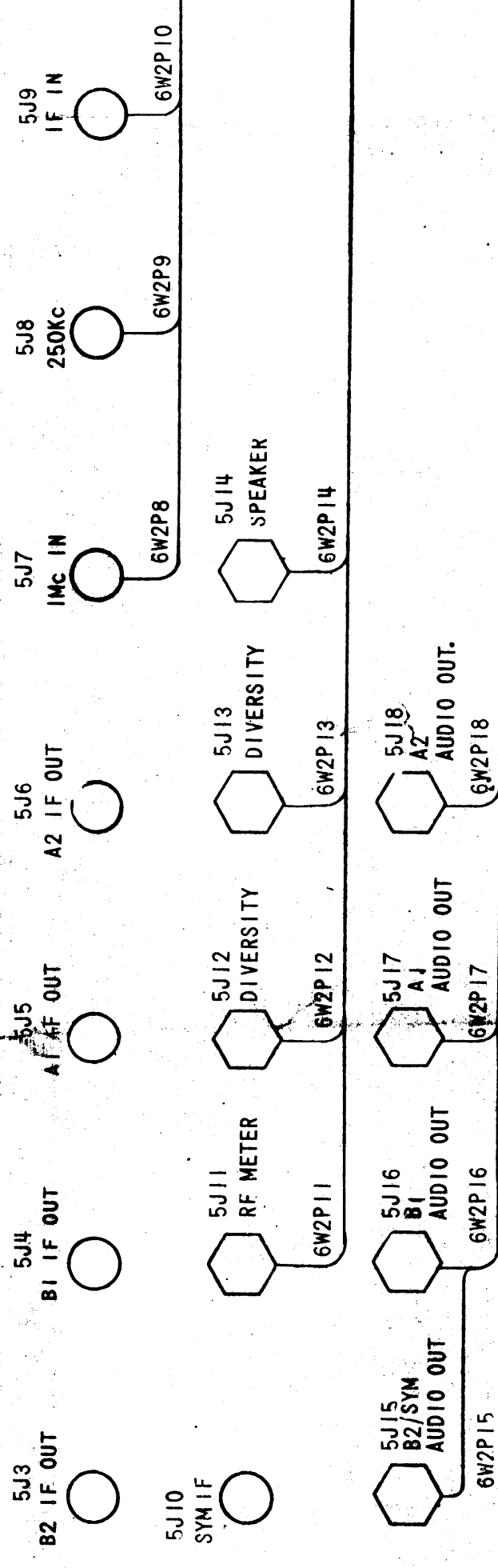


CA1450-4

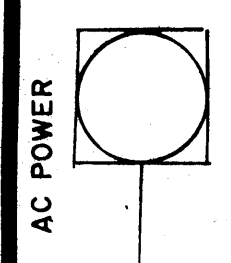
6W8 (CA1498)



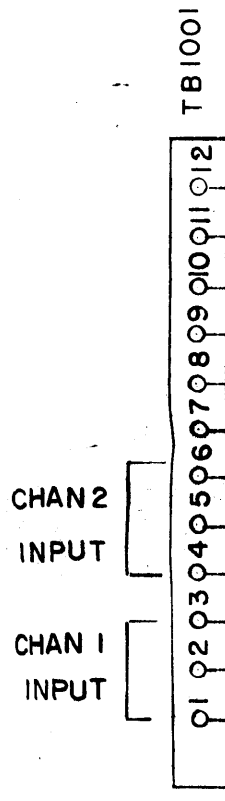
AUDIO OUT 6WIP15  
AUDIO OUT 6WIP16  
AUDIO OUT 6WIP17  
AUDIO OUT 6WIP18



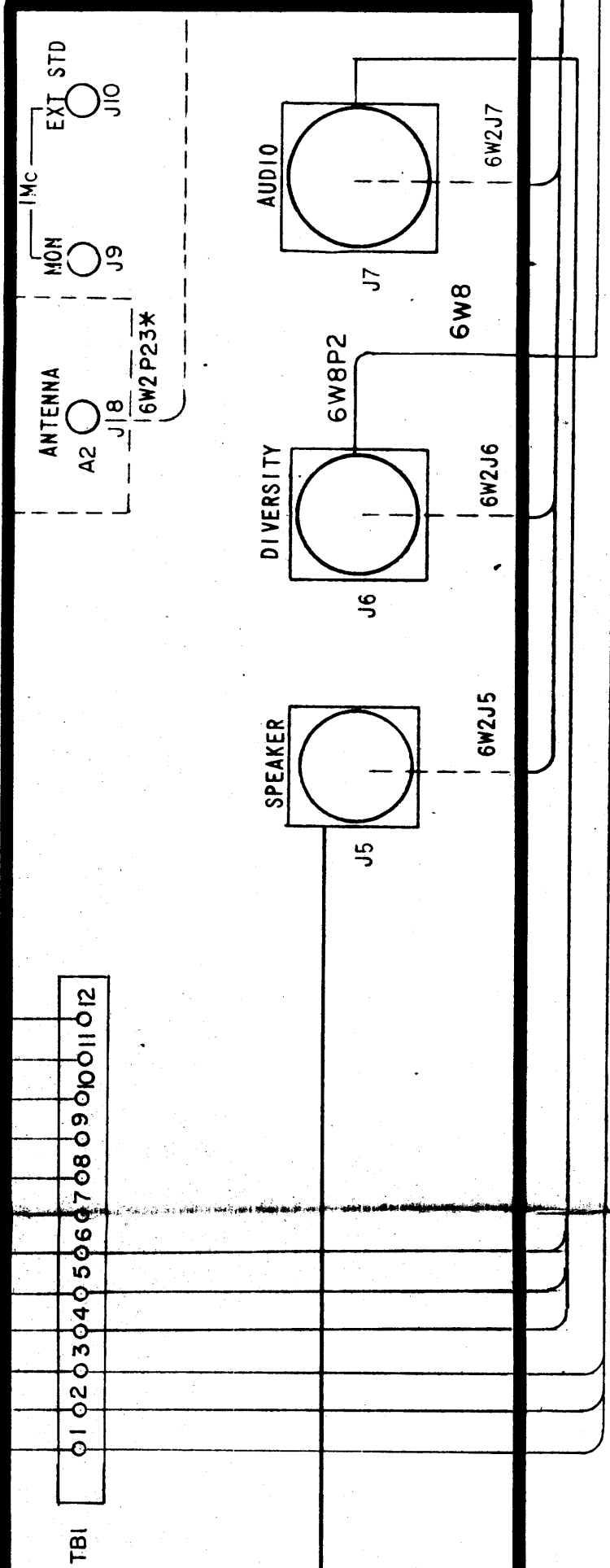
CFA-2



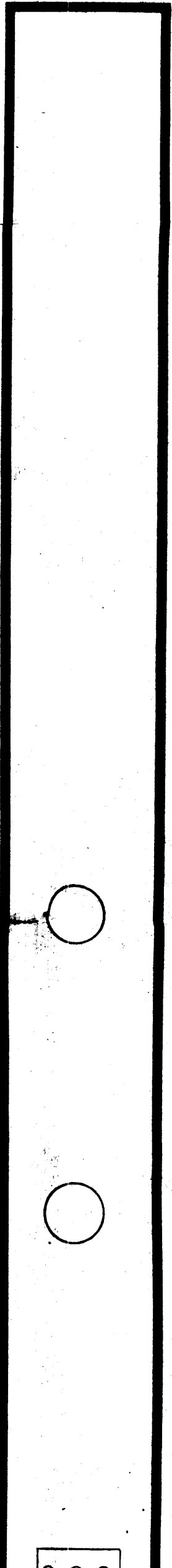
CHAN 2 INPUT  
CHAN 1 INPUT



FACE PANEL NO. 2



HSS-3



NOTE DOTTED LINES DENOTE REAR OF PANEL CONNECTION  
 \* 6W2P23 CONNECTS TO A2J7

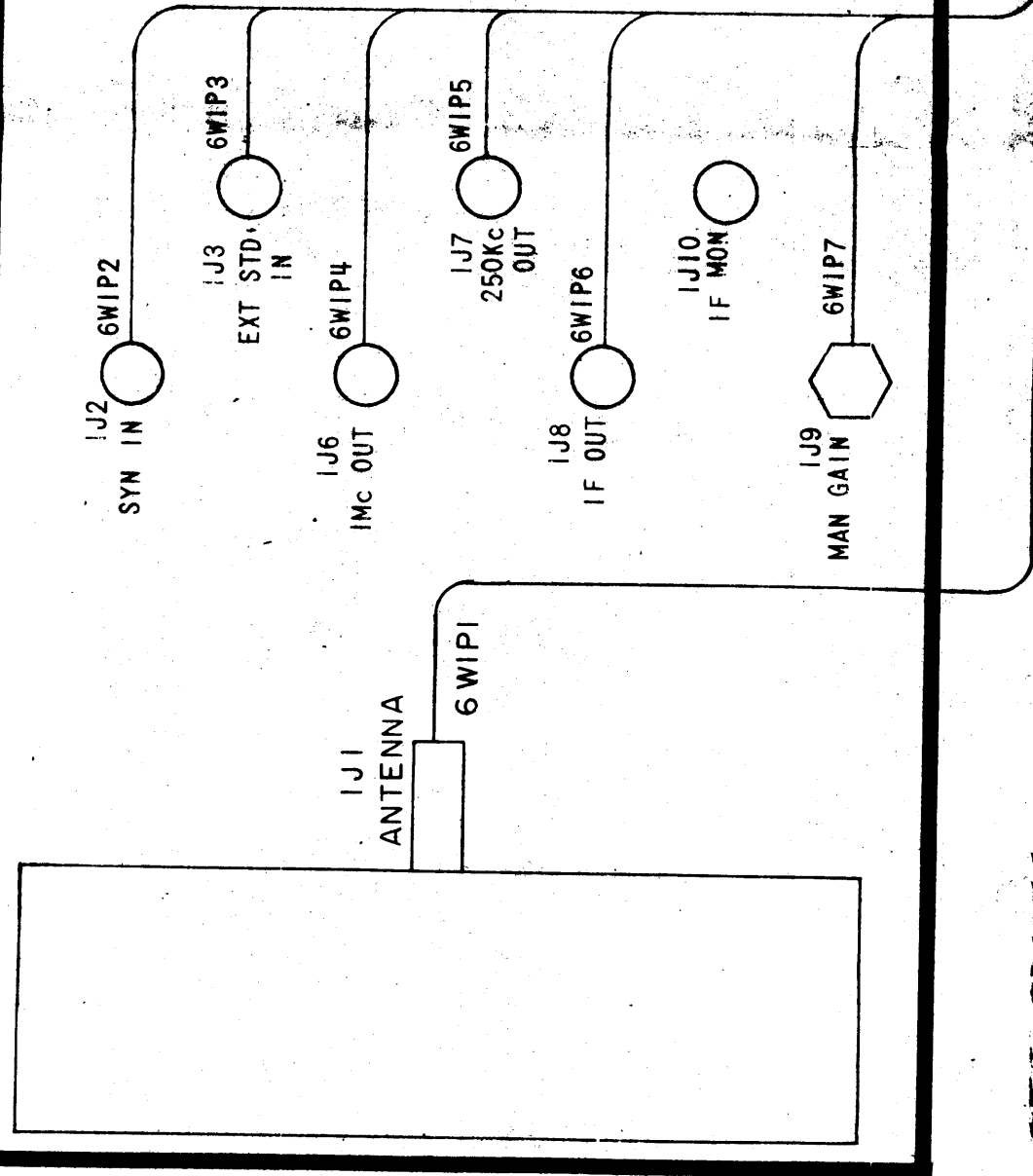
\* NOTE 6W2P23 CONNECT TO A2J7

NOTE DOTTED LINES DENOTE WEAR OF PANEL CONNECTION  
\* 6W2P23 CONNECTS TO A2J7

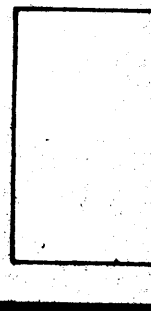
\* NOTE 6W2P23 CONNECT TO A2J7

6W3 (CA1068-1-12)

HFR-4

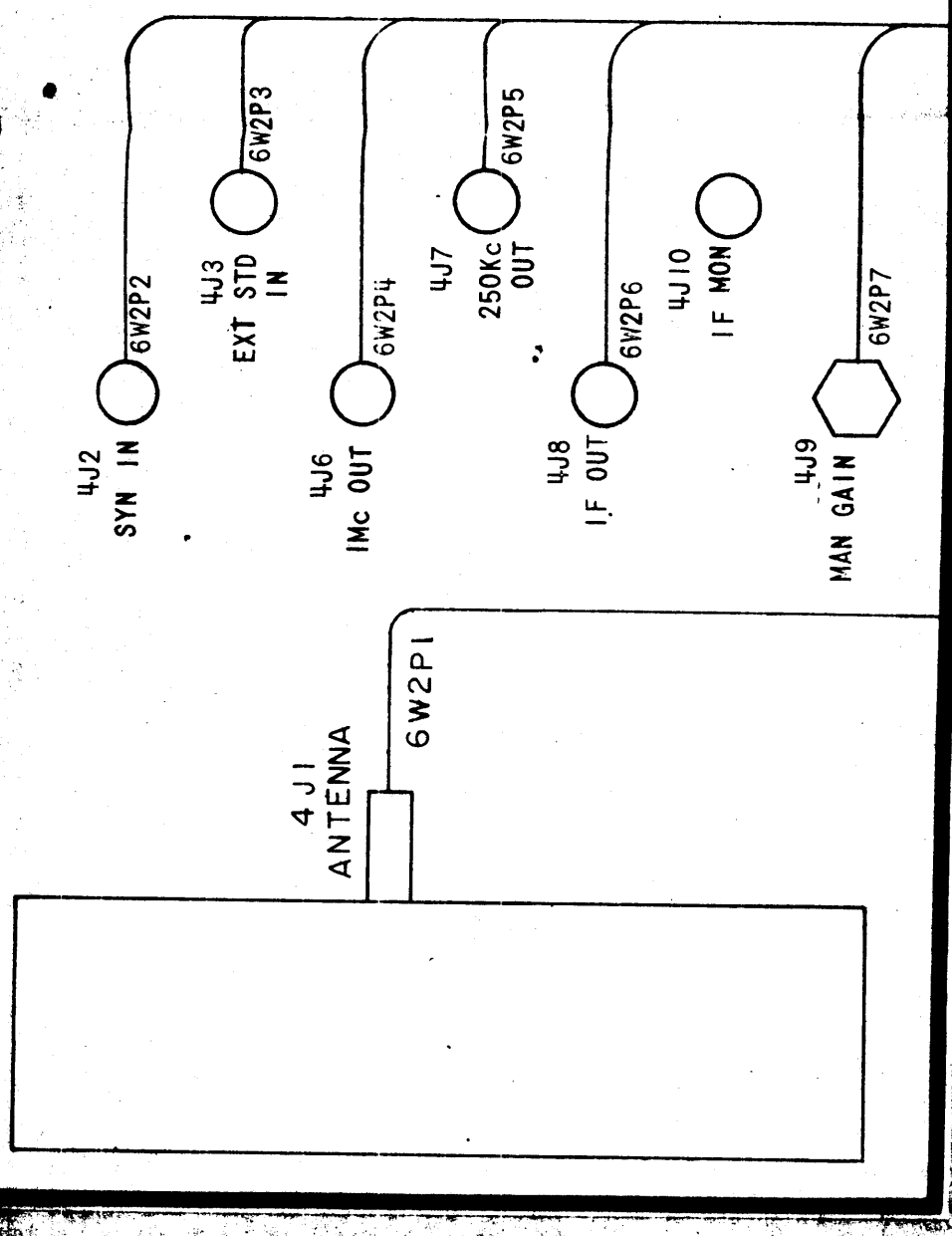


6W1 CABLE ASSEMBLY (CA1450-1)



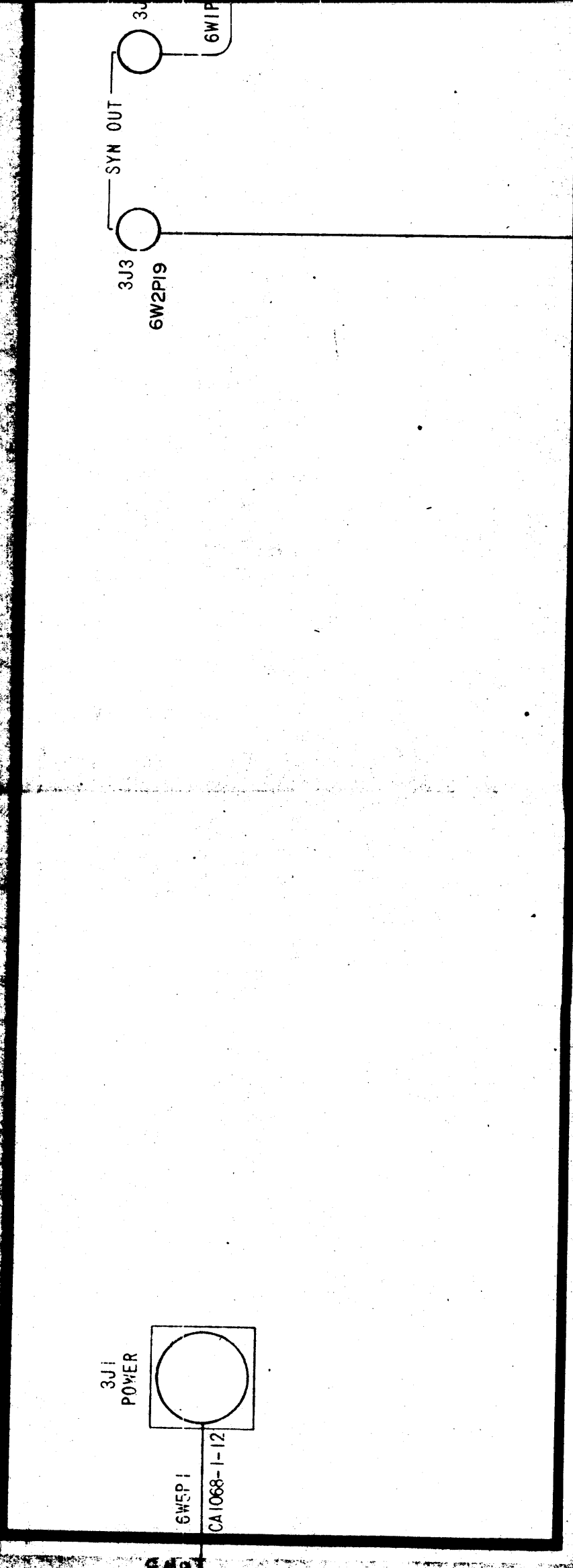
4J2 SYN IN 6W2B2





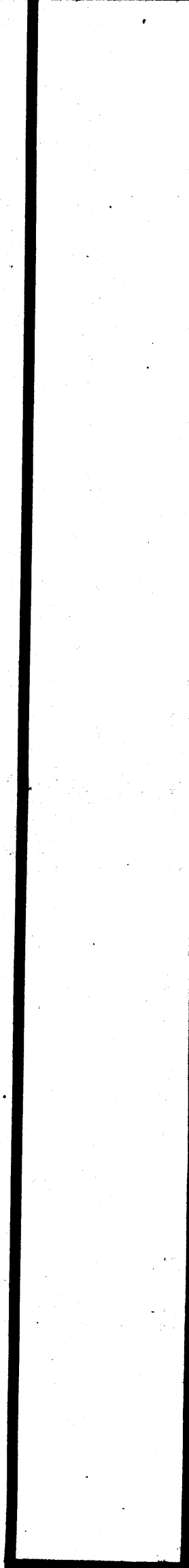
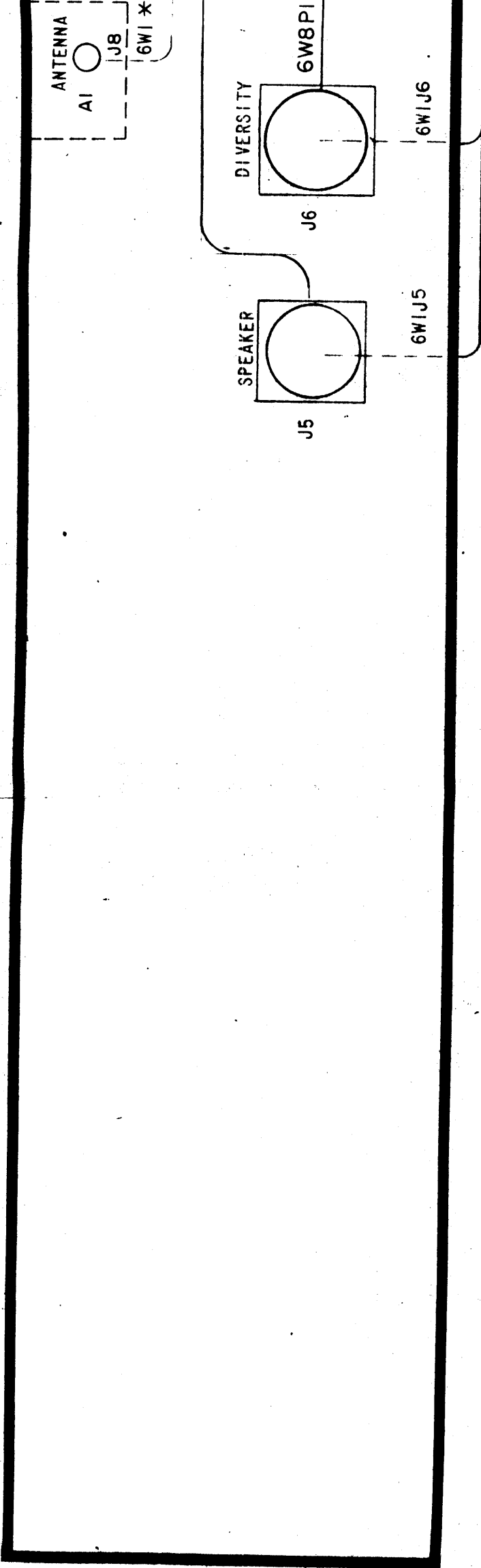
6W2 CABLE ASSY ( CA1450-4 )

HFS-4

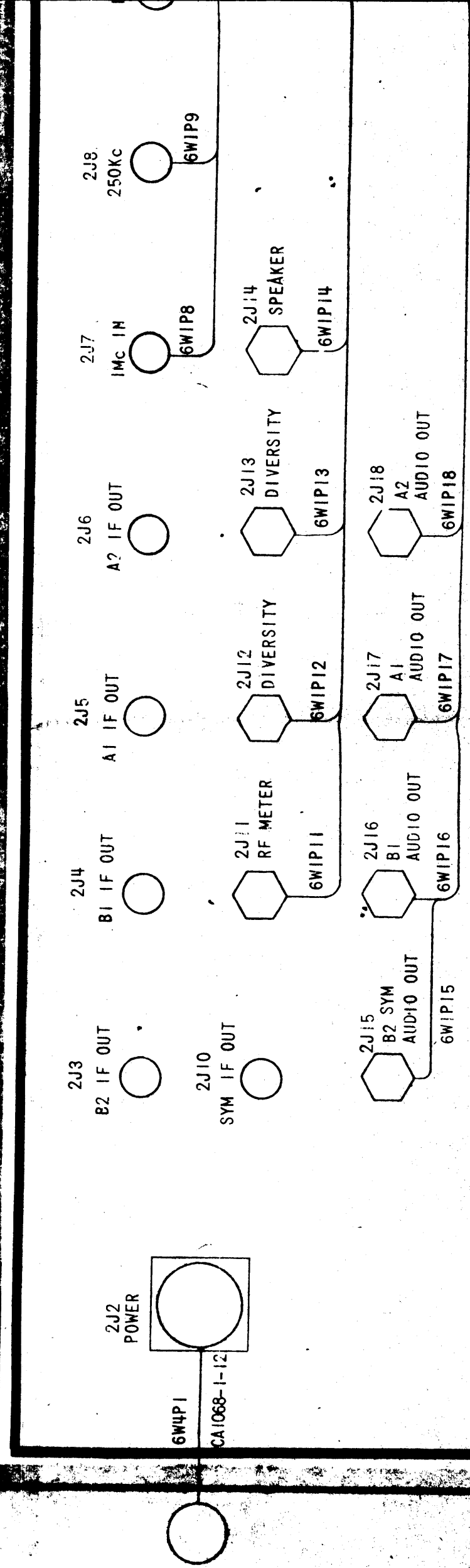


INTERFACE PANEL NO. 1

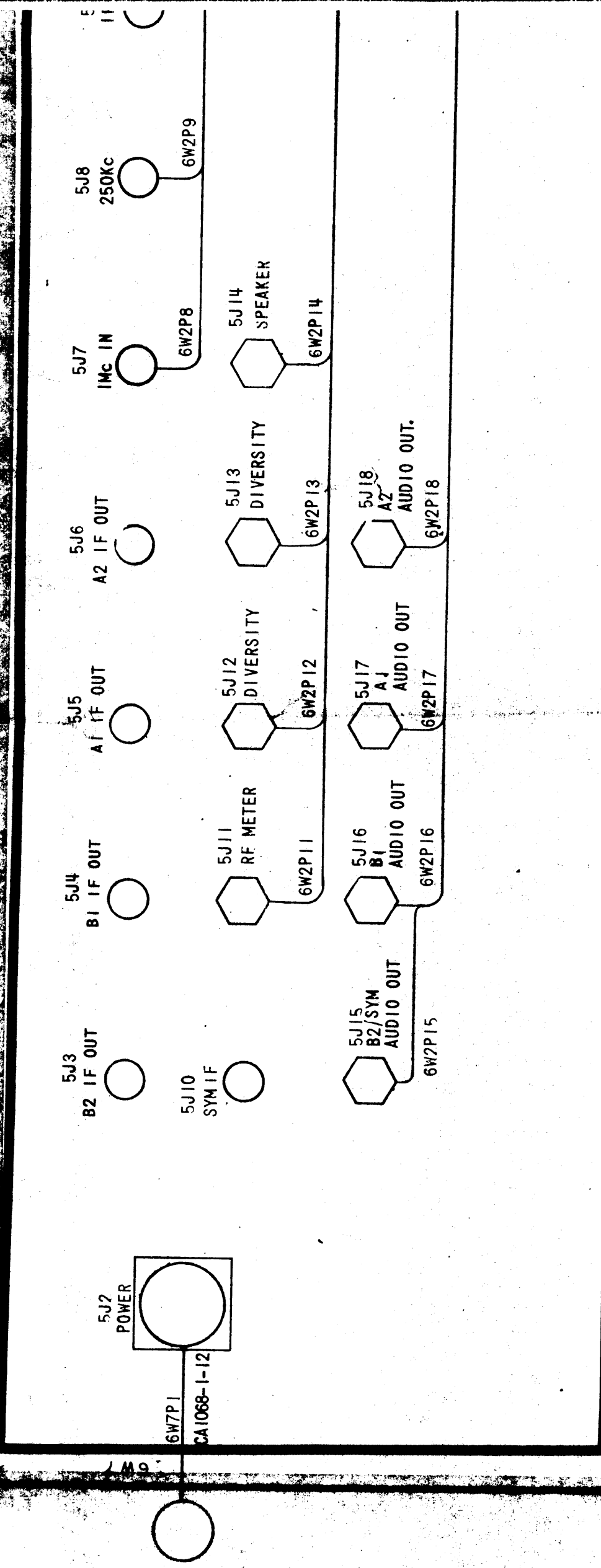
INTERFACE PANEL NO. 1



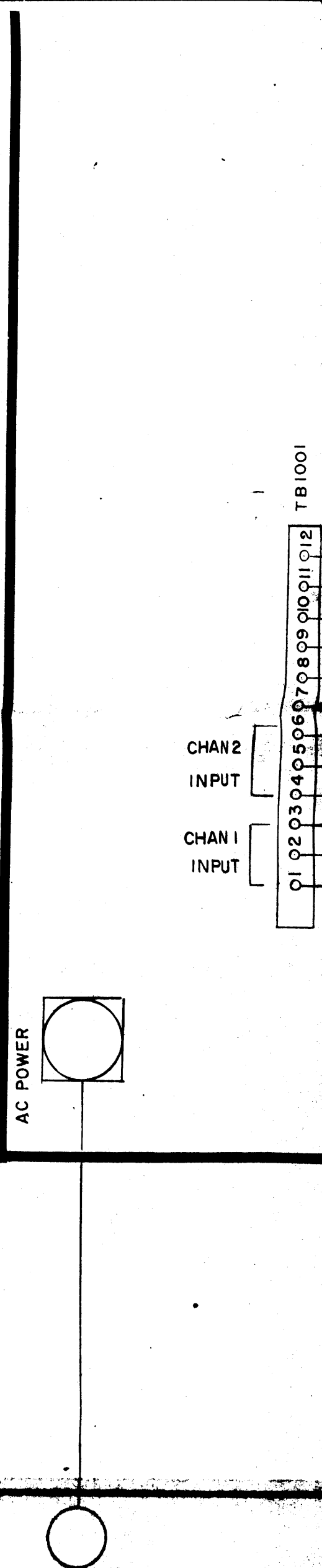
MSA-4

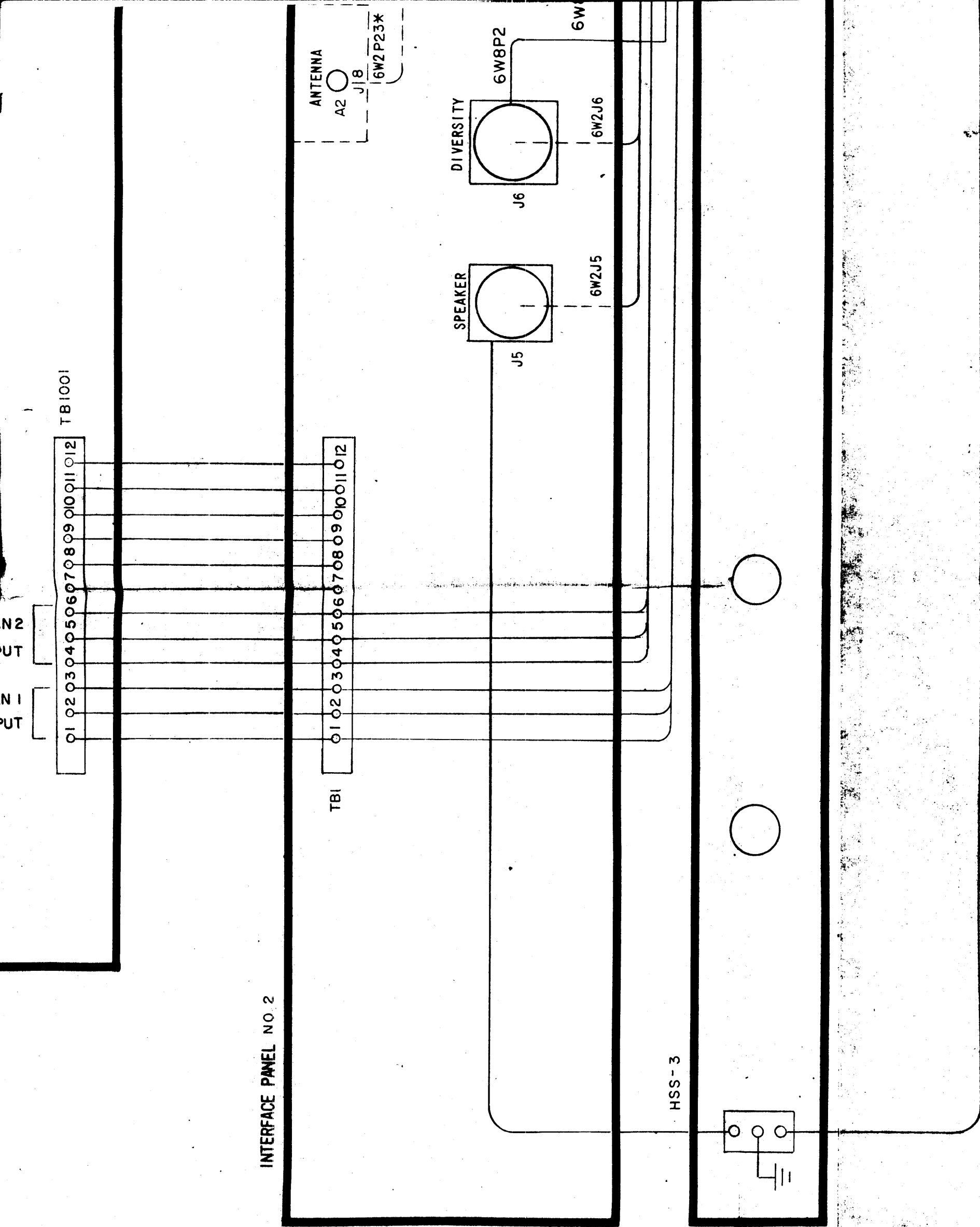


MSA-4



CFA-2





INTERFACE PANEL NO. 2

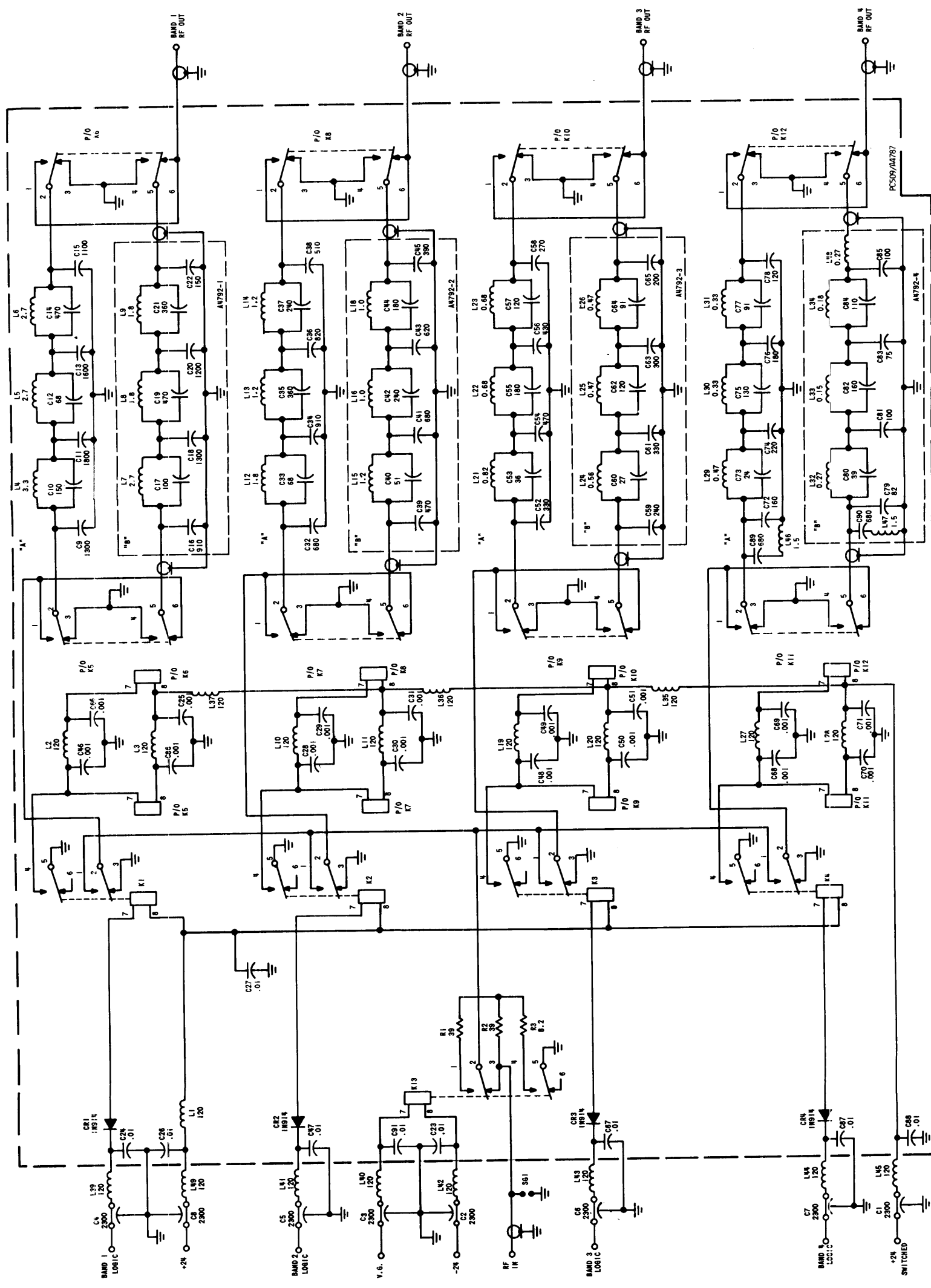
NOTE DOTTED LINES DENOTE REAR OF PANEL CONNECTION  
 \* 6W2P23 CONNECTS TO A2J7

\* NOTE 6

DDR-10 ( )

TOLERANCES ON		LIST OF MATERIAL	
DECIMALS	FRACTIONS		
± 0.005	± 1/64		
± 0.010	± 1/32		
± 0.015	± 3/64		
± 0.020	± 1/16		
± 0.030	± 3/32		
± 0.040	± 1/8		
± 0.050	± 5/64		
± 0.060	± 3/16		
± 0.070	± 7/64		
± 0.080	± 1/4		
± 0.090	± 9/64		
± 0.100	± 5/32		
± 0.125	± 1/4		
± 0.150	± 3/8		
± 0.175	± 7/16		
± 0.200	± 1/2		
± 0.250	± 5/8		
± 0.300	± 3/4		
± 0.375	± 3/4		
± 0.450	± 1		
± 0.500	± 1		
± 0.600	± 1		
± 0.700	± 1		
± 0.800	± 1		
± 0.900	± 1		
± 1.000	± 1		

Figure 5-3.  
RACK CABLING DDR-10



- UNLESS OTHERWISE SPECIFIED:
1. ALL RESISTANCE VALUES ARE IN OHMS; 1/4 WATT
  2. ALL DECIMAL NUMBER CAPACITANCE VALUES ARE IN MICROFARADS
  3. ALL WHOLE NUMBER CAPACITANCE VALUES ARE IN PICOFARADS
  4. ALL INDUCTANCE VALUES ARE IN MICRONERIEES
  5. FILTER "B" IS MOUNTED Y SUB-ASSEMBLY

LAST SYMBOL	MISSING SYMBOL
C81	L17
C82	
C83	
L46	
S3	
S81	

CK 1633

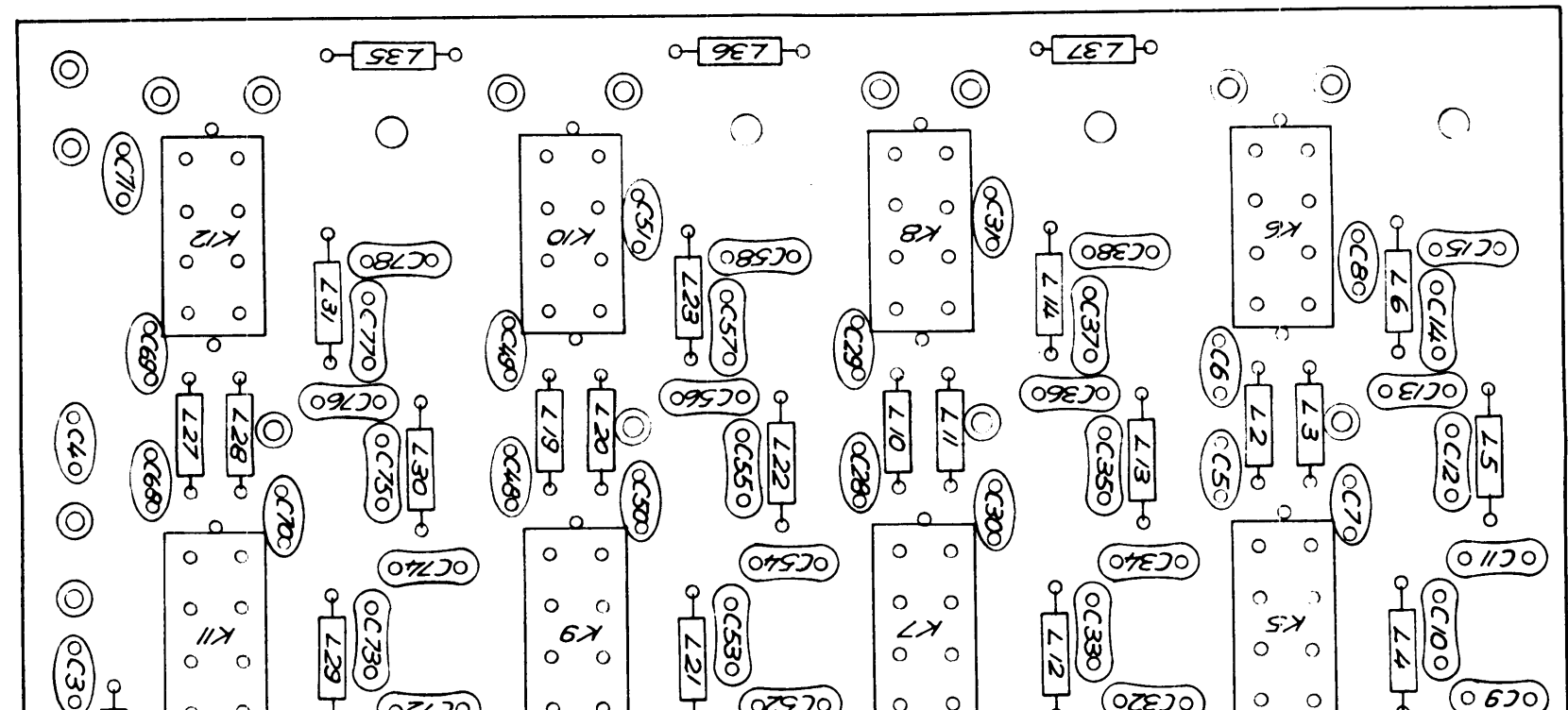
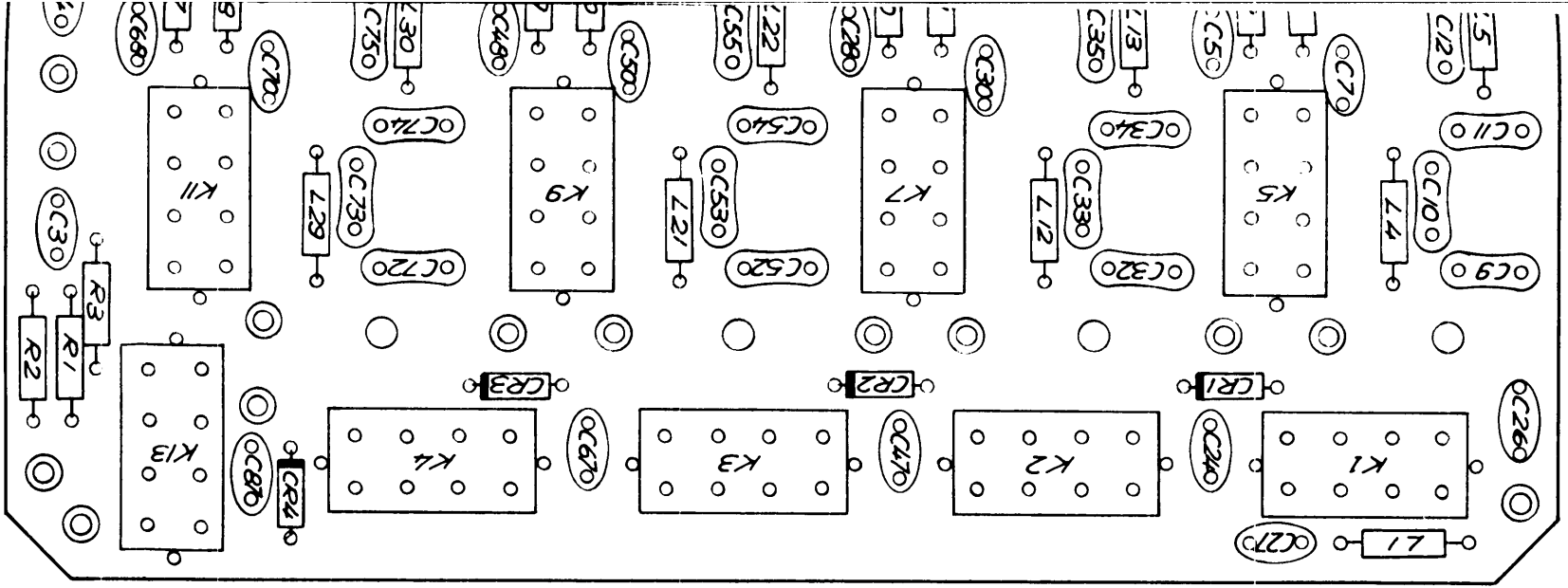


Figure 5-33/5-34. Input/Attenuator 1A11, Schematic/Component Locations Diagram

011690392





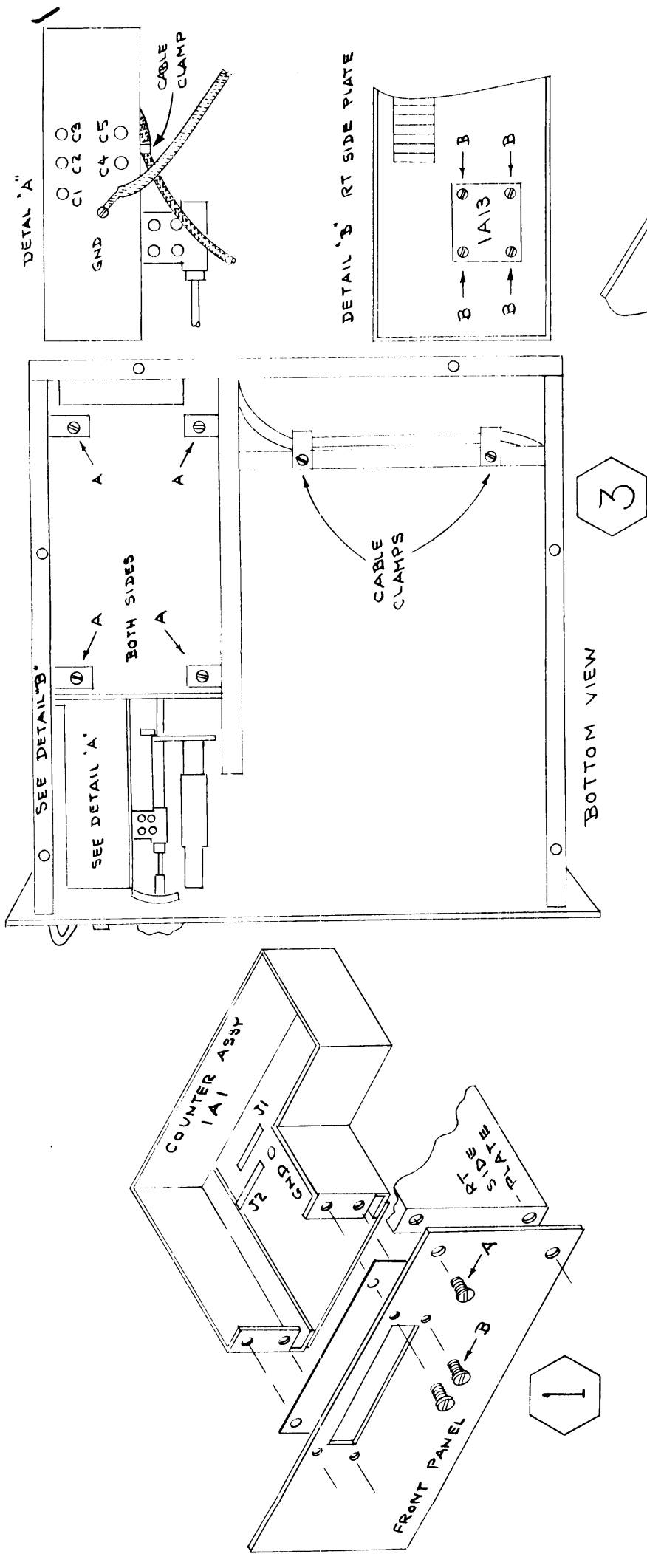


Figure 5-134. Removal of R. F. Tuner and Counter Assemblies