TECHNICAL MANUAL

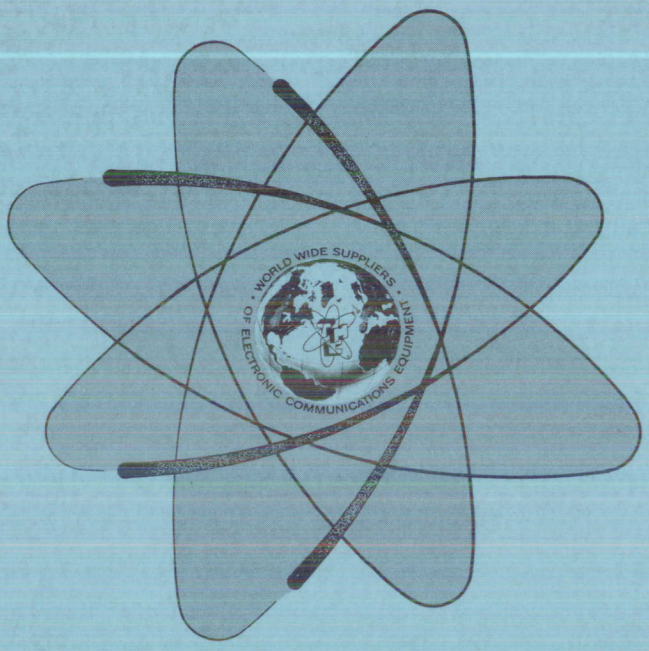
for

COASTAL HARBOR RADIO TRANSMITTING

SYSTEM MODEL SYM 1203

FOR

STATION KOW



THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N.Y. OTTAWA, ONTARIO

Printed in U.S.A.

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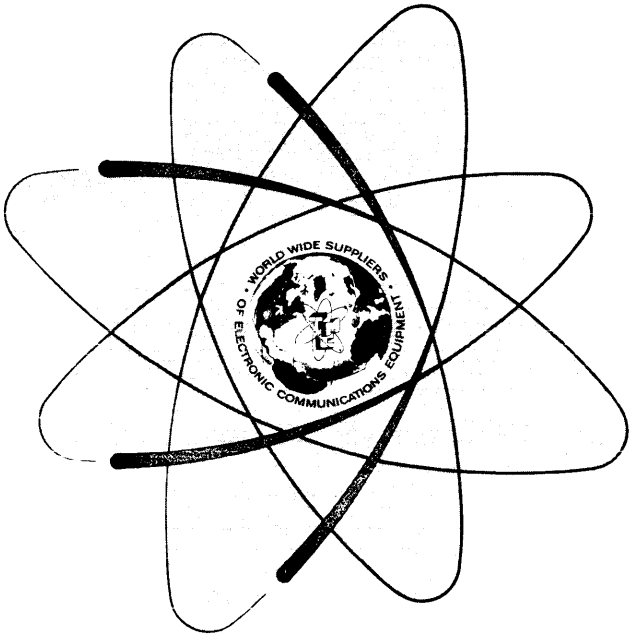

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IN 1067 Issue Date: November 1971

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STE-5A SN 40943	
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AX5138 LINE CONTRO	
PSP-500 SN 40943	
AX5138 LINE CONTR	

RACK A RACK B RACK C

RF & AF ACCESS THROUGH TOP OF CENTER RACK.

POWER ACCESS THROUGH TOP OF EACH RACK.

	SYM 1203	
QTY / UNIT	MODEL USED ON	ASS'Y NO.
APPLICATION		
	CODE	

UNLESS OTHER DIMENSIONS AND INCLUDE CH OR PLATE

TOLERA

DECIMALS
.X ± .05
.XX ± .01
.XXX ± .005

MATERIAL

FINISH

E.M.N.NO	DRAFT	CHKD	ZONE	LT

REVISIONS		
DESCRIPTION	DATE	APPROVED

TPM-1K	5-1/4
RFE-1 SN 40942C	5-1/4
STE-5A SN 40942C 2132	1-3/4
	5-1/4
TPM-1K	5-1/4
RFE-2-4 SN 40943	5-1/4
AX5159 XMTR CONTROL	3-1/2
STE-5A SN 40943A 2522	1-3/4
STE-5A SN 40943B 2482	1-3/4
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	7
PSP-500 SN 40942C	8-3/4
AX5138 LINE CONTROL	3-1/2
PSP-500 SN 40943	8-3/4
AX5138 LINE CONTROL	3-1/2

RACK C

COASTAL HARBOR RADIO TRANSMITTING SYSTEM

KOW

S.O. 518952

QTY. REQ.	ITEM	PART NO.	DESCRIPTION	SYMBOL

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES

TOLERANCES ON

DECIMALS	FRACTIONS
.X ± .05	± 1/64
.XX ± .01	ANGLES
.XXX ± .005	± 0° -30'

MATERIAL

FINISH

FINAL APPROVAL		DATE 6 Oct 71
MECH. DES.		DATE 6 Oct 71
ELECT. DES.		DATE 6 Oct 71
CHECKED		DATE
DRAWN		DATE 4 Oct 71

THE TECHNICAL MATERIEL CORP.
MAMARONECK, NEW YORK

INSTALLATION DRAWING

SYM 1203 figure 1-1

FRONT ELEVATION

SIZE	CODE IDENT NO.	DWG NO.	ISSUE
C	82679	ID400	

SCALE | SHEET OF

ID400

2 1

SECTION 1

GENERAL INFORMATION

1-1. FUNCTIONAL DESCRIPTION

This manual presents system instructions for Radio Transmitting System Model SYM-1203. Included are general descriptions of the equipment, installation and operating procedures; principles of operation and troubleshooting data.

Radio Transmitting System, Model SYM-1203 (figure 1-1), hereinafter referred to as system, consists of three GPT-500YA Transmitters and one GPT-500-4 Transmitter. A GPT-500YA Transmitter is comprised of a PAL-500 Linear Amplifier (combination of RFE-1 and PSP-500) and an STE-5A Exciter. The GPT-500-4 transmitter is a four channel version of the GPT-500YA. The GPT-500-4 is comprised of a PAL-500-4 Linear Amplifier (combination of RFE-2-4 and PSP-500) and four STE-5A Exciters (one for each channel). Therefore, the System 1203 is essentially a multi-channel 500 watt transmitting system housed in three equipment racks. The exciters provide PTT A3H, PTT A3J and PTT A3A modes of emission. The Linear Power Amplifiers amplify the exciter outputs to provide 500 watts output at carrier frequencies of 2522 kHz, 2482 kHz and 2182 kHz. Additionally, the SYM-1203 includes equipment that provide system monitoring, remote control and antenna switching. Table 1-1 lists the system components as they appear in figure 1-1.

TABLE 1-1. COMPONENTS OF RADIO SYSTEM SYM-1203

RACK A NOMENCLATURE	RACK B NOMENCLATURE	RACK C NOMENCLATURE
TPM-1K	Dummy Load	TPM-1K
RFE-1	SLS-4M(4X2)	RFE-1
STE-5A	AX5158	STE-5A
PSP-500		TPM-1K
AX5138		RFE-2-4
		AX5159
		STE-5A (CH-1 Standby)
		STE-5A (CH-2 Standby)
		STE-5A (CH-3 Standby)
		STE-5A (Spare)
		PSP-500
		AX5138

1-2. EQUIPMENT DESCRIPTION

A. TPM-1K Transmitter Power Monitor

The TPM-1K as shown in figure 1-1 serves to provide visual monitoring of the transmitter peak envelope power and reflected power in watts. Terminals are provided on the rear of the unit for external RF indication

and SWR indication within the system. There are four TPM-1K units that monitor the individual transmitter power output.

B. RFE-1, Linear Power Amplifier (p/o GPT-500YA)

The RFE-1 is slide mounted into the equipment cabinet and serves as the power amplifier for the GPT-500YA transmitter. It will accept one of two RF inputs, a low input of 100 milliwatts or a high input of 1 watt. The RFE-1 requires 100 milliwatts or less to produce the 500 watt peak envelope power.

C. STE-5A, Sideband Strip Exciter (p/o GPT-500YA)

The exciter is a fixed frequency single channel unit that provides 100 milliwatts excitation voltage to the power amplifier section of the transmitter. The system includes three exciters, one for each channel frequency in addition to four standby exciters and one spare exciter. The spare exciters are used in conjunction with a multi-channel ledex operated linear amplifier. This combination of four exciters and one four channel linear amplifier forms a four channel standby transmitter.

D. AX5138, Line Control Unit

Line Control unit AX5138 provides external ON/OFF control of primary 115 vac to the PAL-500 linear amplifier. The control unit also provides remote interlock closure. There are no operating controls therefore operation consists of the application of 48 vdc for transmitter control. The system includes four AX5138 Line Control units, one for each linear amplifier.

E. AX5158, System Control Unit

System Control Unit is located in rack B and provides the interconnections for system channel select, mode select (A3A, A3H and A3J) audio inputs; transmitter power on; standby transmitter channel and mode select.

This unit accepts external inputs for system operation and routes information to the appropriate channel via the associated system control patch field.

F. SLS-4M, Antenning Switching Matrix

The model SLS-4M Matrix switch is basically a four column, two row antenna switch incorporated into the system to provide antenna thru connections for transmitters number 2, 3 and 4 (2522, 2482 and 2182 respectively). Transmitter number 1 (Standby) is terminated via the matrix into the dummy load supplied. Transmitter number 1 can be substituted for Transmitter 2, 3 and 4 and Transmitters 2, 3 and 4 can also be routed to the dummy load.

G. AX5159, Transmitter Control Unit

Transmitter Control Unit AX5159 is used in conjunction with the four channel Linear Amplifier Model RFE-2-4. This unit provides RF output switching and termination for the standby exciters. The unit consists of coaxial switches, one for each standby exciter output, and coaxial terminators one for each exciter. The appropriate exciter's output is switched to the four channel amplifier RF input via the AX5159 control unit.

H. RFE-2-4, Four Channel Linear Amplifier

The RFE-2-4 is used in the system as the standby transmitter amplifier. This unit (RFE-2-4) is a fixed frequency, four channel ledex operated amplifier, that is capable of local or remote operation. Remote channel selection is provided in the system via the transmitter Control Unit AX5159. The RFE-2-4 amplifier used with the four STE-5A exciters (in Rack C) provide 500 watt PEP output on four pre-selected channel frequencies. The combintation is commonly known as the Model GPT-500-4.

1-3. PHYSICAL DESCRIPTION

As shown in figure 1-1, the system consists of three equipment cabinets, 83-7/8 inches high by 69 inches wide (23 inches each cabinet) by 22-1/2 inches deep, which houses all the components which comprise the SYM-1203. Primary power connections are made at the AC strip, located in the rear of the equipment cabinet. RF power is routed through Low Pass Filter LPF-750-3 to transmitter Power Monitor and re-routed to Antenna Switching Matrix, SLS-4M, located in the front of the equipment cabinet. The GPT-500YA and GPT-500-4 components (STE-5A and PAL-500) are slide mounted into the equipment cabinet for easy access and maintenance purposes.

1-4. REFERENCE DATA

The Transmitting System, Model SYM-1203 consists of three model GPT-500YA Transmitters and one GPT-500-4 Transmitter which are FCC type accepted under part 81 and is type approved by the Department of Transport in Canada, refer to the Technical Manual for the GPT-500YA and GPT-500-4 technical specifications.

SECTION 2

INSTALLATION

2-1. UNPACKING AND HANDLING

The SYM-1203 Transmitter System is shipped in boxes as shown by (figures 2-1 and 2-2). The box number is stenciled on the outside of each box and the contents are listed on the packing list. Inspect all boxes for possible damage when they arrive at the operating site. With respect to equipment damage for which the carrier is liable, The Technical Materiel Corporation will assist in describing methods of repair and the furnishing of replacement parts.

Inspect the contents of each box for possible damage and inspect the packing material for parts that may have been shipped as loose items.

2-2. POWER REQUIREMENTS

All units of the System leave the factory wired for 115 volt, 50/60 cycle, single phase line voltage unless ordered otherwise. Power consumption of the system is approximately 5000 watts (2300 watts for Rack A, 2300 watts for Rack C and 500 watts for Rack B); power cabling of sufficient size to provide 30 amperes at 115 volts ac, single phase, is adequate.

2-3. INSTALLATION

a. Location of Transmitter - Before attempting to install the SYM-1203 ensure that adequate power (paragraph 2-2) is available at the selected site or location. Refer to outline dimensional drawing figure 2-3 when choosing the operating location. The room (or van) in which the transmitter is located must have a ceiling height of at least 7 feet. Adequate ventilation must be provided; operation of the transmitter in a poorly ventilated room will cause the surrounding temperature to become too high. Also, a clearance of about two feet at the rear of the rack is needed for opening the door.

After unpacking and inspecting the cabinet, place it in its operating location. It is advisable to do this while modular units are not installed because the added weight of the assembled transmitter will make movement more difficult. The four holes in the top of the rack and the four eyebolts included as loose parts in the shipment are for moving the rack with a crane hoist. Holes in the base are for rigid-mounting or shock mounting the rack to the floor. Holes along the top of the rear wall are for the top shock mounts. Use these holes as a template for drilling holes in the shelter or van.

NOTE

Equipment Racks A, B and C should be installed in the selected location and lined up as indicated in figure 1-1. Cable access holes are provided at rear and sides of each rack for routing inter-connecting cables between racks.

b. Installation of Modular Units - Refer to figure 1-1 for information regarding cabinet location of all modular units. Note serial number on each unit and install units as indicated on figure 1-1 according to serial number.

All GPT-500 modular units (RFE, STE-5A and PSP-500) are slide mounted into the equipment cabinets. To install any slide-mounted unit in its compartment refer to figure 2-4 and proceed as follows:

(1) Untape or unstrap cable assemblies and all other components secured to the rack frame for shipment.

(2) Pull center section of associated compartment track out until it locks in an extended position.

(3) Position slide mechanisms of modular unit in tracks, and ease modular unit forward into rack until release buttons engage hole in track.

(4) Start at the bottom and proceed up to prevent the rack from tipping over.

(5) Make the necessary cable and electrical connections as described in paragraph 2-3c. To prevent the cables extending from modular units from snagging, utilize the reel-mounted springs located inside the rack.

(6) Depress release buttons and slide modular unit completely into compartment.

(7) Secure front panel of modular units to the rack with screws or panel locks.

(8) Dummy Load Installation (refer to figure 1-1).

NOTE

The load resistor installation requires two installation personnel. Thermaline load resistor must be installed in the rear of rack B on the uppermost panel. Four mounting holes are provided on the panel for horizontal mounting of the load resistor to the panel.

(a) Locate the load resistor on the rear panel above Antenna Matrix switch. The RF INPUT connector must face towards the "DUMMY" connector on the rear of matrix switch assembly.

(b) Align four load resistor mounting bracket holes with panel holes and insert the mounting screws through the front panel and tighten.

(c) Connect 50 ohm coaxial cable from load RF INPUT connector to "DUMMY" connector on Antenna Matrix switch assembly.

c. Interconnection of Modular Units - Figure 2-5 illustrates the cabling and wiring interconnection between the various modular units contained in the system. Refer to figure 2-5 and connect modular units as indicated.

d. Initial Adjustments - The SYM-1203 has been factory tested and adjusted before disassembly for crating. No initial adjustments of chassis mounted variable components are necessary before operation.

e. External Connections to SYM-1203 (Racks A, B and C)

(1) Primary AC Input Connections - There are three AC input leads (black, white and green) located at the top end of the AC strip in the rear of each equipment cabinet. Connect the green lead to ground, black and white leads to primary AC input (115 vac).

NOTE

Cable entry holes are provided at the top of the equipment cabinet for 600 ohm audio lines, remote emission mode select, remote channel select, status indicators and RF output. Determine required length and route cables through cable entry holes and connect as indicated below.

(2) RF Output Connections (Rack B)

Transmitter RF output connections are made at the Antenna Switching Matrix rear chassis connectors and should be connected as follows:

Transmitter Number 2 (channel 1 2522 kHz) to TX2
Transmitter Number 3 (channel 2 2482 kHz) to TX3
Transmitter Number 4 (channel 3 2182 kHz) to TX4
Transmitter Number 1 (standby transmitter)to TX1

Transmitters 2, 3 and 4 are thru connections to ANT (antenna) 1, 2 and 3 respectively.

Transmitter 1 is routed to the dummy load.

NOTE

Three 50 ohm dummy loads (Bird Model 8141) are supplied to be used in place of antennas during installation and check out of the system. These dummy loads should be connected to ANT 1, 2, and 3. Connecting coaxial cables are supplied for connecting the dummy loads.

(3) Audio Input Connections (Rack B)

All Audio inputs to the system should be connected to Audio jack J2 located on the rear of System Control Unit AX5158. Refer to figure 2-6 sheet 2 and make the connections to mating plug supplied as a loose item, as indicated and connect plug to Audio jack J2. Audio input leads should be shielded pairs.

(4) System Control Connections (Rack B)

System control connections are terminated at Control jack J1

located on the rear of System Control Unit AX5158. Refer to figure 2-6 and Table 2-1 and make the appropriate connections to the mating plug for J1 supplied as a loose item.

The system requires a closure to ground for the following functions, this ground can be via pushbutton, switch, etc.:

TABLE 2-1. SYSTEM CONTROL FUNCTION CONNECTION

Function	Provide a Ground Closure At J1
PWR ON (2522)	Pin "d"
PWR ON (2482)	Pin "S"
PWR ON (2182)	Pin "F"
PWR ON Standby	Pin "2"
Mode Select	**Provide a Ground Closure At J1**
A3J (2522)	Pin "b"
A3A (2522)	Pin "a"
A3H (2522)	Pin "Z"
Com (2522)	Pin "Y"
A3J (2482)	Pin "P"
A3A (2482)	Pin "Q"
A3H (2482)	Pin "N"
Com (2482)	Pin "M"
A3J (2182)	Pin "D"
A3A (2182)	Pin "C"
A3H (2182)	Pin "E"
Com (2182)	Pin "A"
Function	**Provide a Ground Closure At J1**
Standby Transmitter Channel Select:	
2522 kHz	Pin "S"
2482 kHz	Pin "m"
2182 kHz	Pin "p"
Common	Pin "k"

TABLE 2-2. SYSTEM STATUS INDICATOR CONNECTION

NOTE

The Systems Status indicators provide a ground closure for use with external monitoring equipment. The RF IND provides a ground to indicate NO RF OUTPUT.

Indication	Ground Provided At J1
Standby Transmitter Channel Ind:	
2522 kHz	Pin "s"

TABLE 2-2. SYSTEM STATUS INDICATOR CONNECTION (continued)

Indication	Ground Provided At J1
2482 kHz	Pin "t"
2182 kHz	Pin "u"
Standby Transmitter MODE Ind:	
A3H	Pin "w"
A3A	Pin "x"
A3J	Pin "y"
RF IND (2522)	Pin "g"
PV ON IND (2522)	Pin "f"
CARR ON IND (2522)	Pin "c"
RF IND (2482)	Pin "V"
PV ON IND (2482)	Pin "U"
CARR ON IND (2482)	PIN "R"
RF IND (2182)	Pin "J"
PV ON IND (2182)	Pin "H"
CARR ON IND (2182)	Pin "E"
Standby Transmitter	
RF IND	Pin "4"
PV ON IND	Pin "3"
Power ON IND	
2522 kHz	Pin "e"
2482 kHz	Pin "T"
2182 kHz	Pin "G"
Standby	Pin "z"
VSWR IND	
2522	Pin "h"
2482	Pin "W"
2182	Pin "K"
Standby	Pin "5"

Check all connections made for system control and status indications. Bear in mind that, system control functions require a GROUND CLOSURE to enable remote operation, and status indications are ground closure fed back to external monitoring equipment.

Refer to the operator's section for turn on and check out procedures.

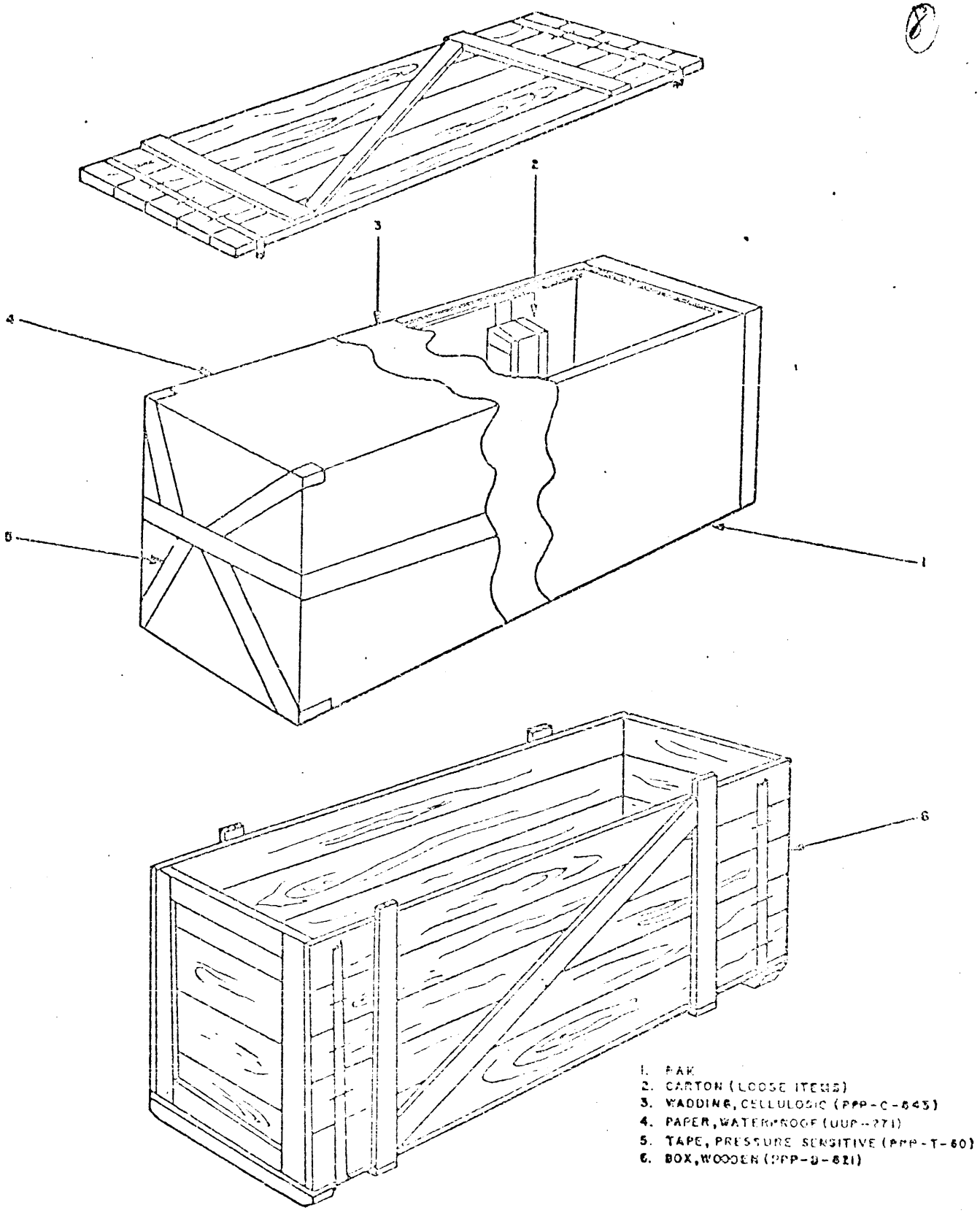
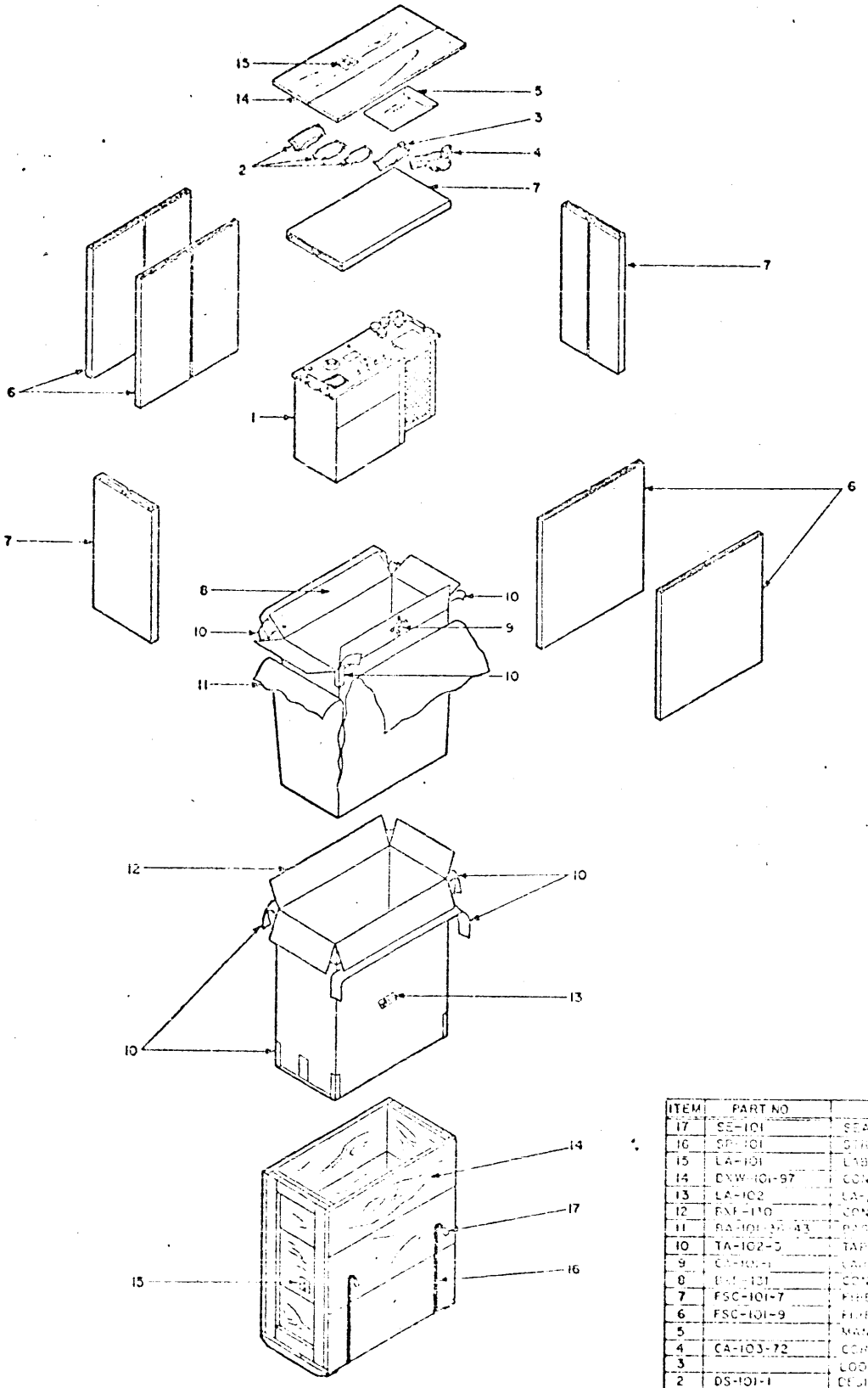


Figure 2-1. Rack, Preparation for Shipment



ITEM	PART NO	DESCRIPTION
17	SS-101	SEALS, STRAPPING
16	SP-101	STRAPPING, STEEL
15	LA-101	LABEL, FRAGILE
14	DNW-101-97	CONTAINER, SHIPPING
13	LA-102	LA-, METHOD II
12	PAF-110	CONTAINER, OUTER
11	PA-101-35, 43	PAD, CUSHION
10	TA-102-5	TAPE, PRESSURE SENSITIVE
9	CA-101-1	CARD, HUMIDITY INDICATOR
8	PAF-101	CONTAINER
7	FSC-101-7	FIBERBOARD SHEET, CREASED
6	FSC-101-9	FIBERBOARD SHEET, CREASED
5		MANUALS, INSTRUCTION
4	CA-103-72	CORD, LINE
3		LOOSE ITEMS
2	DS-101-1	DESICCANT, 16 UNIT
1		MODULAR UNIT

Figure 2-2. Modular Units, Preparation for Shipment Typical

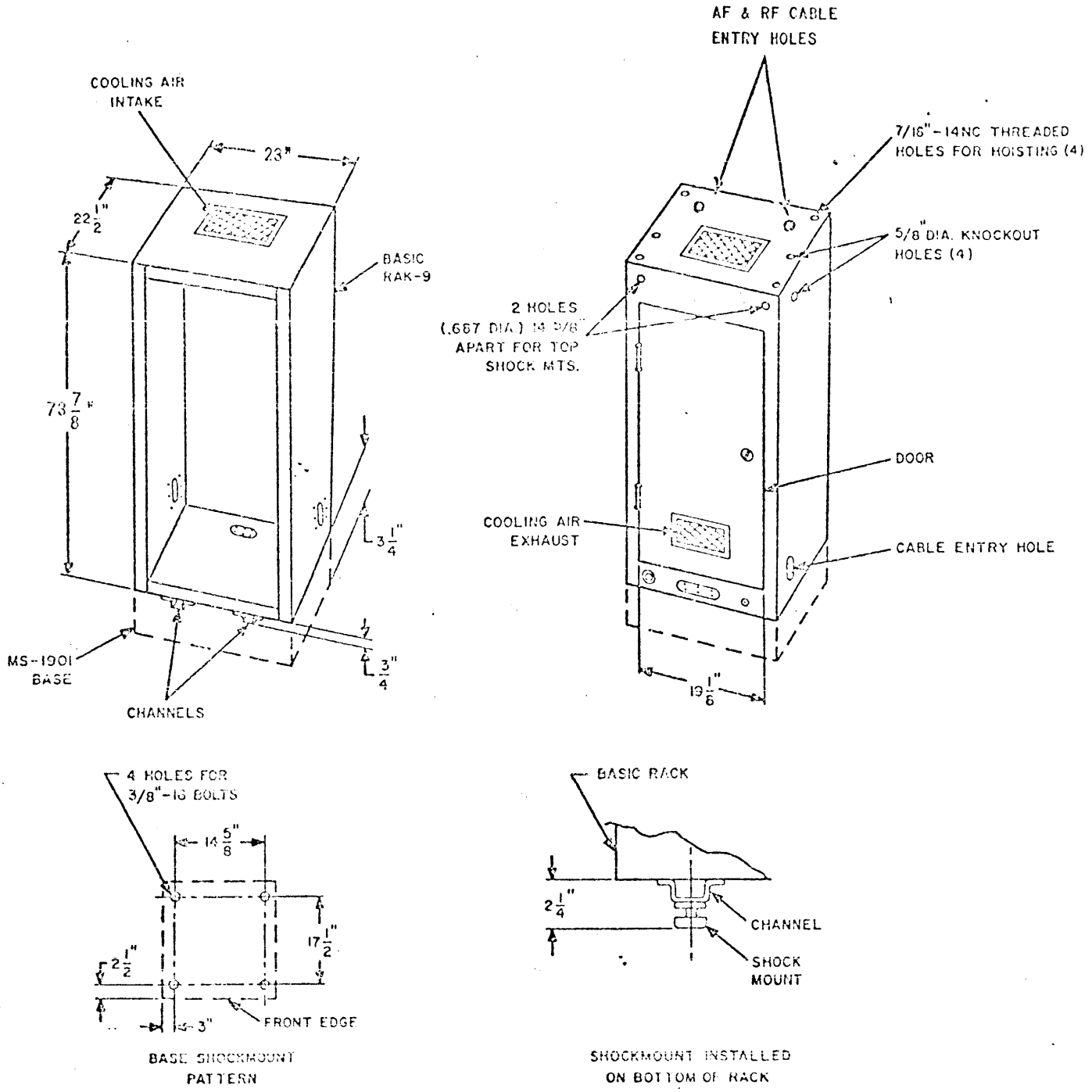
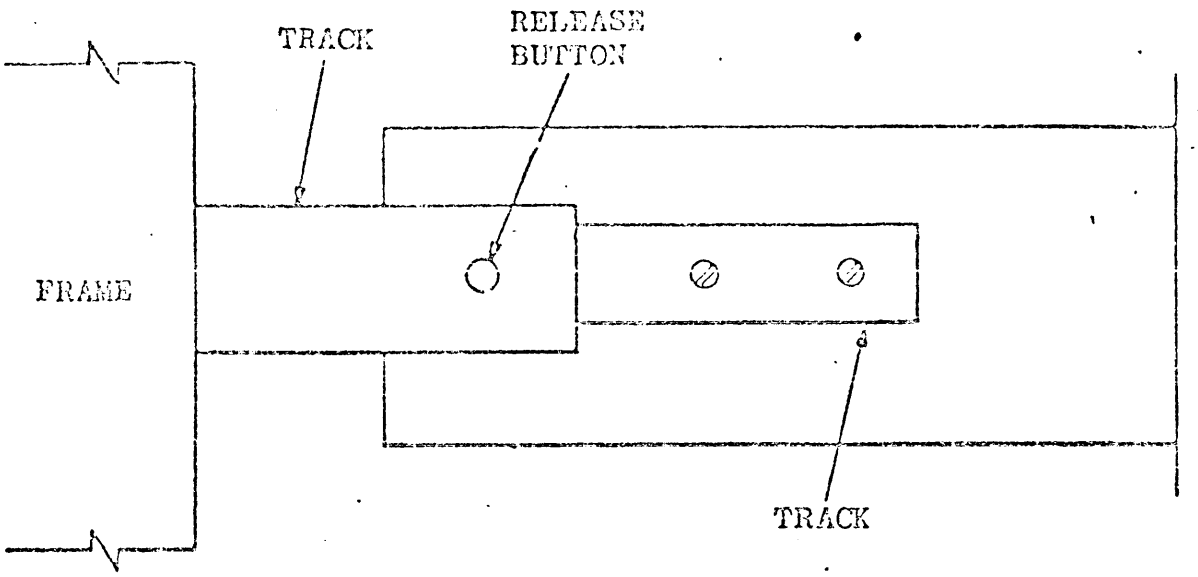
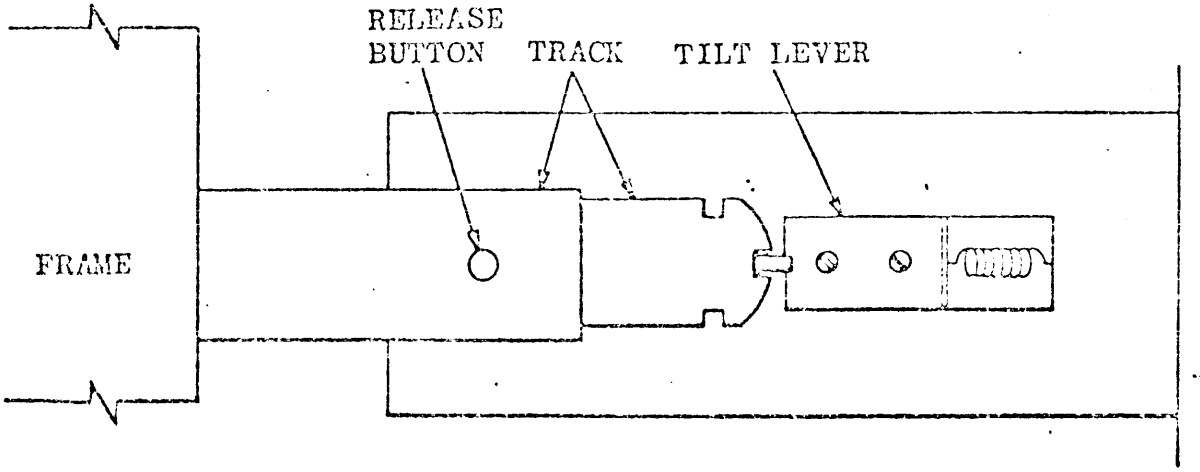


Figure 2-3. Outline Dimensional and Installation Drawing

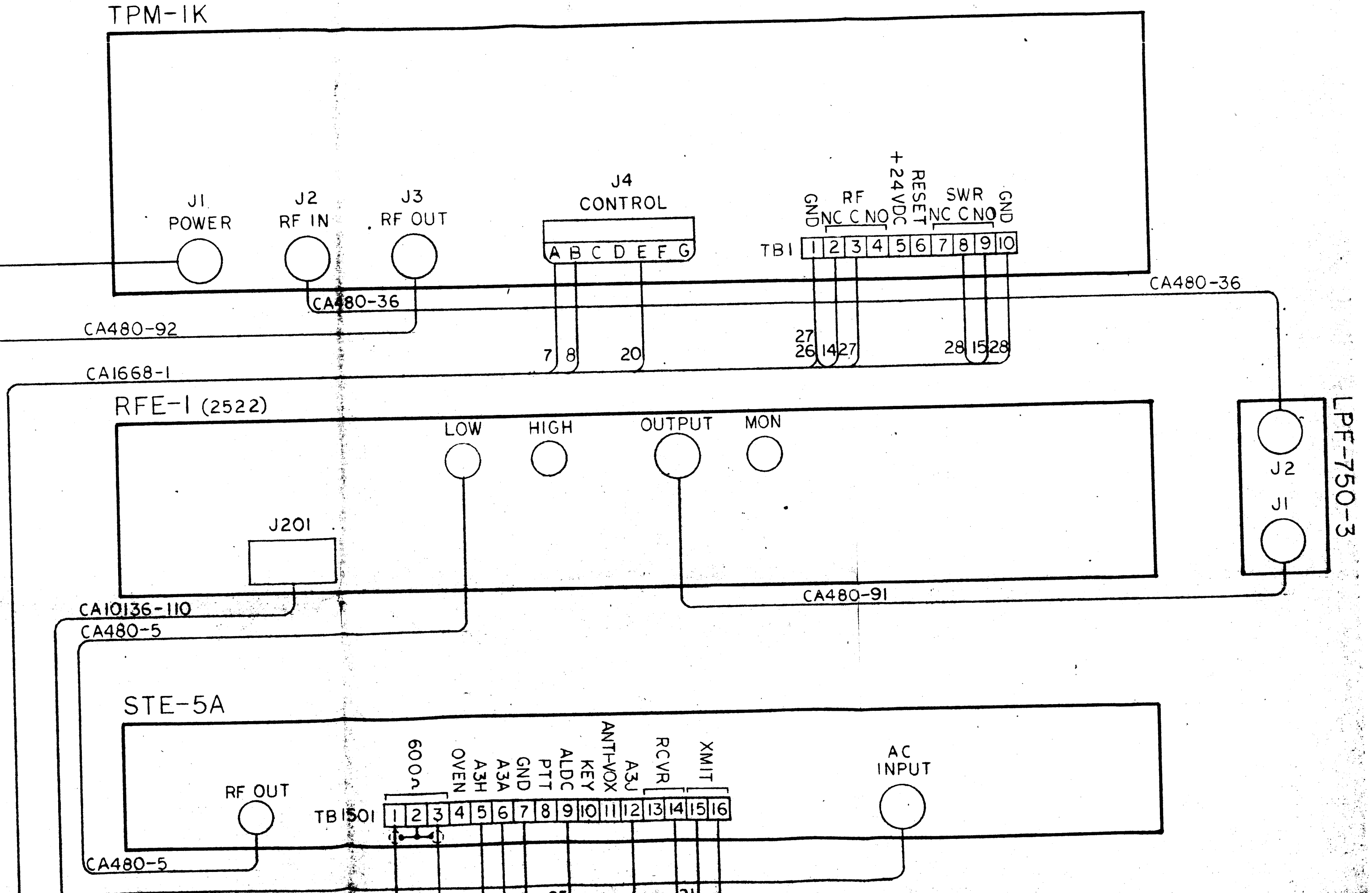


NON-TILT CHASSIS SLIDE



TILT CHASSIS SLIDE

Figure 2-4. Slide-Mounting Details


TPM-1K
J1
POWER
J2
RF IN
J3
RF OUT
J4
CONTROL
A B C D E F G
GND
NC C NO
RF
+24VDC
RESET
NC C NO
SWR
GND
TB1
1 2 3 4 5 6 7 8 9 10
CA480-36
CA480-92
7 8 20
27
26 14 27
28 15 28
CA1668-1
RFE-1 (2522)
LOW
HIGH
OUTPUT
MON
J201
CA10136-110
CA480-5
CA480-91
J2
J1
LPF-750-3
STE-5A
RF OUT
TB1501
600Ω
OVEN
A3H
A3A
GND
PTT
ALDC
KEY
ANT-VOX
A3J
RCVR
XMIT
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
AC
INPUT
CA480-5

CA1668-1

1R 1B 10 11 24 23 25 24 12 13 21 20 25

TPM-1K

J1 POWER

J2 RF IN

J3 RF OUT

J4 CONTROL

A B C D E F G

GND RF NC C NO + 24 VDC RESET SWR NC C NO GND

TB1 1 2 3 4 5 6 7 8 9 10

CA480-36

CA480-92

CA480-36

7 8 20

27 26 14 27 28 15 28

CA1668-2

RFE-1 (2482)

LOW HIGH OUTPUT MON

J201

CA10136-110

CA480-5

CA480-91

LPF-750-3

J2

J1

STE-5A

RF OUT

600Ω OVEN A3H A3A GND PTT ALDC KEY ANTI-VOX A3J RCVR XMIT

TB 1501 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

AC INPUT

CA480-5

CA1668-2

1R 1B 10 11 24 23 25 24 12 13 21 20 25

CA1668-2

1R 1B 10 11 24 23 25 24 12 13 21 20 25

PSP-500

PLATE ON-OFF | ANT RELAY | REM INTLKS

TB101 1 2 3 4 5 6

J101 P2

J102

18 21 2 3 6 8

CA1668-1

CA10136-110

AX5138

NC C NO + −

TB2 6 5 4 3 2 1

NC NOC 115V

TB1 6 5 4 3 2 1

23 22 17 19 16

CA1668-1

7 6 5 4

PSP-500

PLATE ON-OFF | ANT RELAY | REM INTLKS

TB101 1 2 3 4 5 6

J101 P2

J102

18 21 2 3 6 8

CA1668-2

CA10136-110

AX5138

NC C NO + −

NC NOC 115V

AX5138

NC C NO + −

TB2 6 5 4 3 2 1

23
22 17 19 16

CA1668-2

NC NO C 115V

TB1 6 5 4 3 2 1

7 6 5 4

CA1668-1

TB1

F1
1/2a

M B1

4
5
4
5

F2
1/2a

M B2

CA1668-2

CA1668-1

CA1668-2

1R 1B 10 11 12 13 22 26 14 15 16 17 2 3 18 19

A B C D E F G H J K L M N P R S T

TO J5 AX5158
SYSTEM CONTROL

1R 1B 10 11 12 13 22 26 14 15 16 17 2 3 18 19

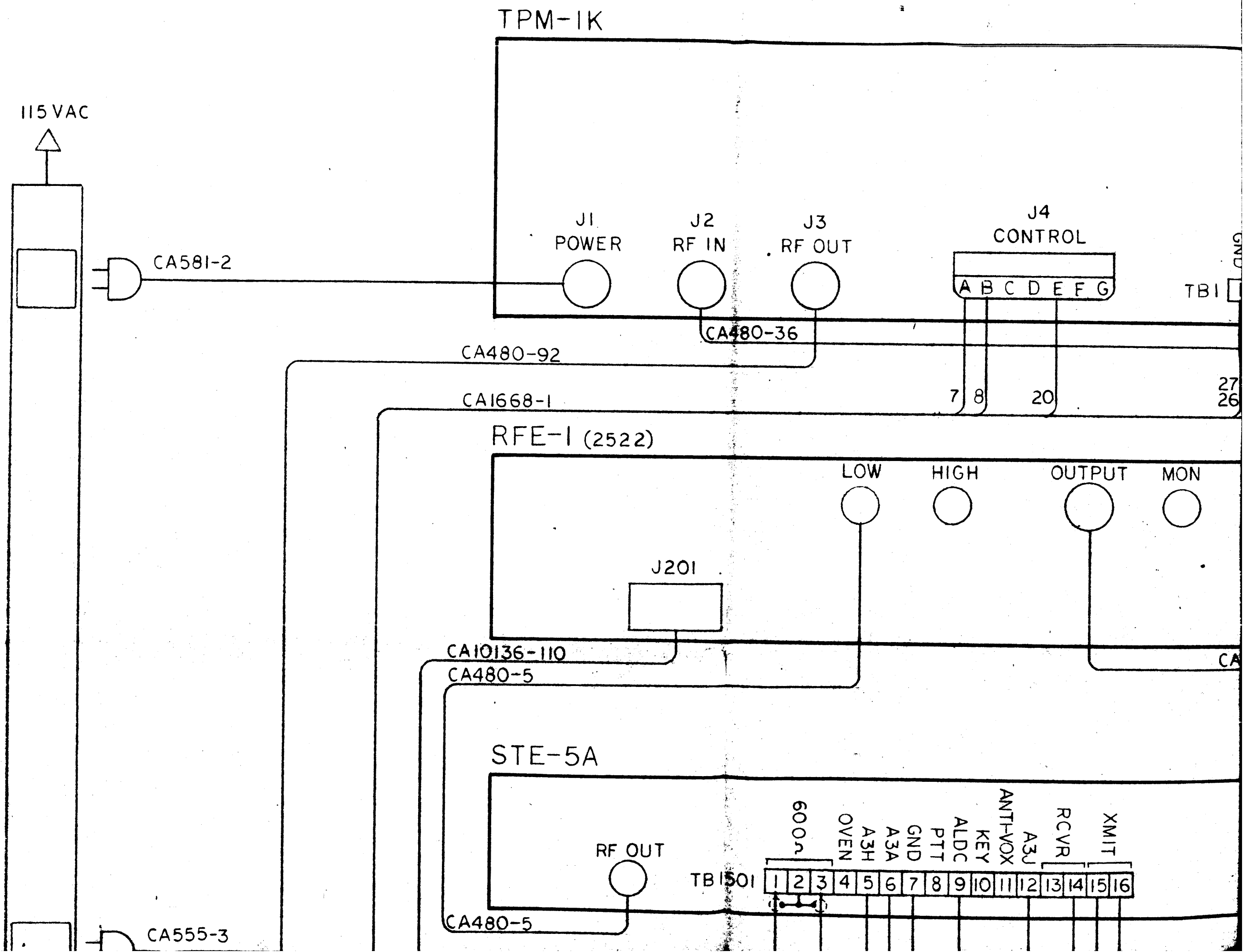
A B C D E F G H J K L M N P R S T

AUDIO
A3H
A3A
A3J
CARR ON IND
GND
RF IND
VSWR IND
PWR ON
PWR ON IND
PV ON IND
PV ON
24 VDC

TO J4 AX5158
SYSTEM CONTROL

CA480-92

TO TX3 MATRIX


TPM-1K
115 VAC
CA581-2
J1
POWER
J2
RF IN
J3
RF OUT
J4
CONTROL
A B C D E F G
TB1
GND
CA480-36
CA480-92
CA1668-1
7
8
20
27
26
RFE-1 (2522)
LOW
HIGH
OUTPUT
MON
J201
CA10136-110
CA480-5
CA
STE-5A
RF OUT
TB1501
600Ω
A3H OVEN
A3A
GND
PTT
ALDC
KEY
ANT-VOX
A3J
RCVR
XMIT
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
CA480-5
CA555-3

CA555-3

CA581-2

CA480-5

CA1668-1

TPM-1K

J1 POWER

J2 RF IN

J3 RF OUT

J4 CONTROL

A B C D E F G

GND NC

TBI 1 2

CA480-36

CA480-92

CA1668-2

RFE-1 (2482)

LOW HIGH OUTPUT MON

J201

CA10136-110

CA480-5

STE-5A

RF OUT

TB 1501 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

600Ω OVEN A3H A3A GND PTT ALDC KEY ANTI-VOX A3J RCVR XMIT

CA480-5

CA555-3

CA480-5

CA555-3

CA1668-2

1R 1B 10 11 24 23 25 24 12 13 21 20 25

PSP-500

PLATE ON-OFF | ANT RELAY | REM INTLKS

TB101 1 2 3 4 5 6

J101 P2

J102

18 21 2 3 6 8

CA1668-1

CA10136-110

AX5138

NC C NO + −

TB 2 6 5 4 3 2 1

23 22 17 19 16

CA1668-1

PSP-500

PLATE ON-OFF | ANT RELAY | REM INTLKS

TB101 1 2 3 4 5 6

J101 P2

J102

18 21 2 3 6 8

CA1668-2

CA10136-110

AX5138

P1

ZONE	LTR	DESCRIPTION	DATE	E.M.NO	DRAFT	CHKD	APPD

REVISIONS

SYSTEM CONTROL

1R 1B 10 11 12 13 22 26 14 15 16 17 2 3 18 19

A B C D E F G H J K L M N P R S T

24 VDC
PV ON
PV ON IND
PV ON IND
PWR ON IND
PWR ON
VSWR IND
RF IND
GND
CARR ON IND
A3J
A3A
A3H
AUDIO

TO J5 AX5158
SYSTEM CONTROL

CA1668-1

CA1668-2

CA10136-110

AX5138

TB2 6 5 4 3 2 1 (NC C NO + −)

23 22 17 19 16

CA1668-2

B1 M F1 1/2a

B2 M F2 1/2a

TB1 1 2 3 4

4 5 4 5

CA1668-1 CA1668-2

CA1668-1

CA1668-2

1R 1B 10 11 12 13 22 26 14 15 16 17 2 3 18 19

A B C D E F G H J K L M N P R S T

TO TX3 MATRIX

CA480-92

TO TX2 MATRIX

CA480-92

P1

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ELECT. DES.		DATE 1 Dec 71
CHECKED		DATE
DRAWN		DATE 1 Dec 71

THE TECHNICAL MATERIEL CORP.
MAMARONECK, NEW YORK

DIAGRAM, WIRING
TRANSMITTING SYSTEM
SYM 1203 RACK A

Figure 2-5

SIZE	CODE IDENT NO.	DWG NO.	ISSUE
	82679	CK1924	

SCALE NONE | SHEET 1 OF 2

DUMMY LOAD

CA480-34

MATRIX

ANT 3

ANT 2

ANT 1

DUMMY

STBY TX 1

2182 TX 4

2482 TX 3

2522 TX 2

FROM RACK A

2522 RF OUT

RACK A

2522 RF OUT

2482 RF OUT

INDICATORS TB 1

MOTOR: STBY/ANT 1, STBY/ANT 2, STBY/ANT 3

MANUAL: ROW A/COL 4, 2522/ROW B, 2482/ROW B, 2182/ROW B

COM

9 10 11 12 17

MOTORS TB 2

2522 TURN, 2522 THRU, 2482 TURN, 2482 THRU, 2182 TURN, 2182 THRU, GND

1 2 3 4 5 6 17

XMTR INTLKS TB3

STBY, 2522, 2482, 2182

8 13 14 15 16

ANT INTLKS TB4

ANT 1, ANT 2, ANT 3, DUMMY

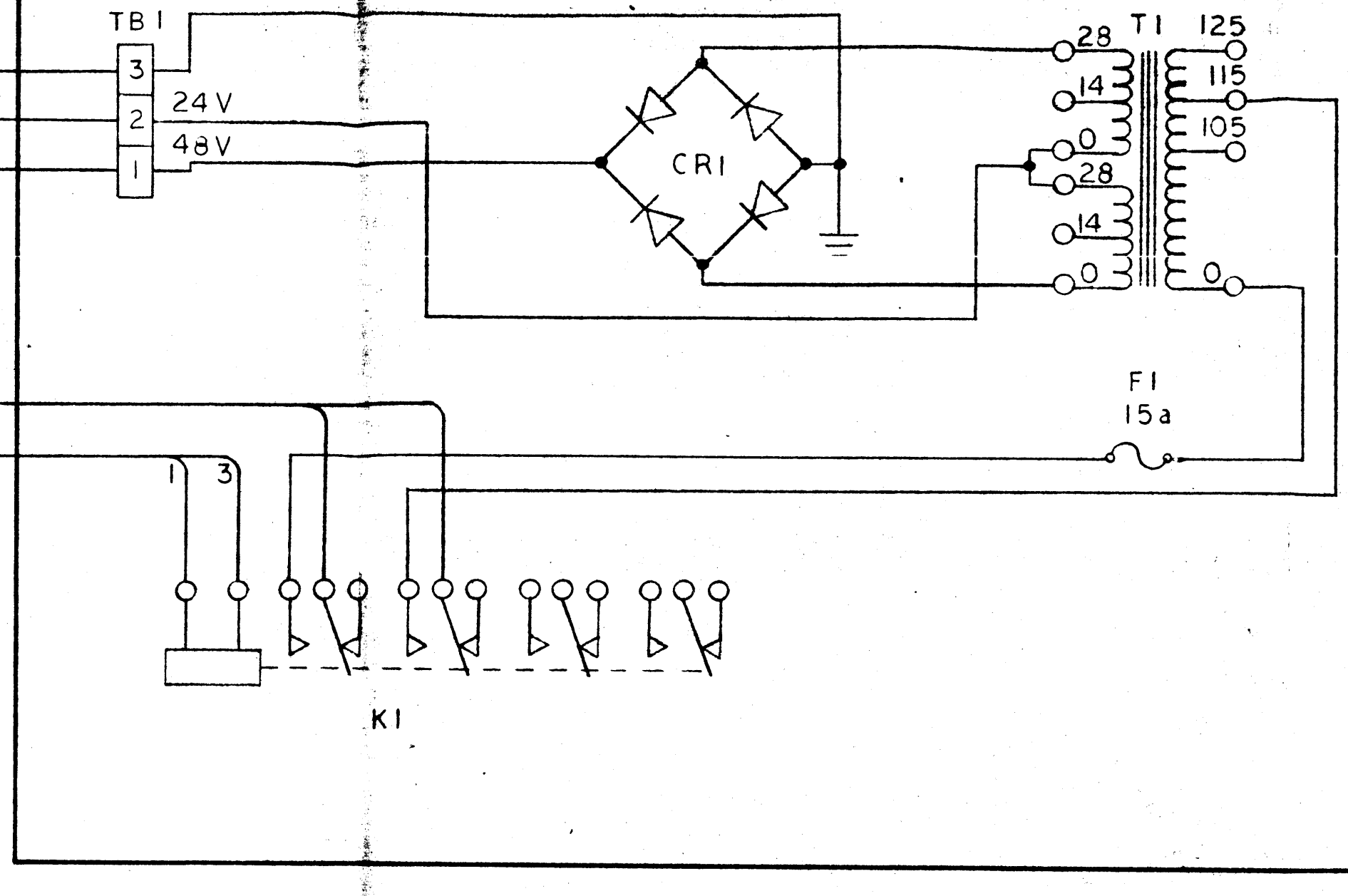
CA1666

PWR SPLY

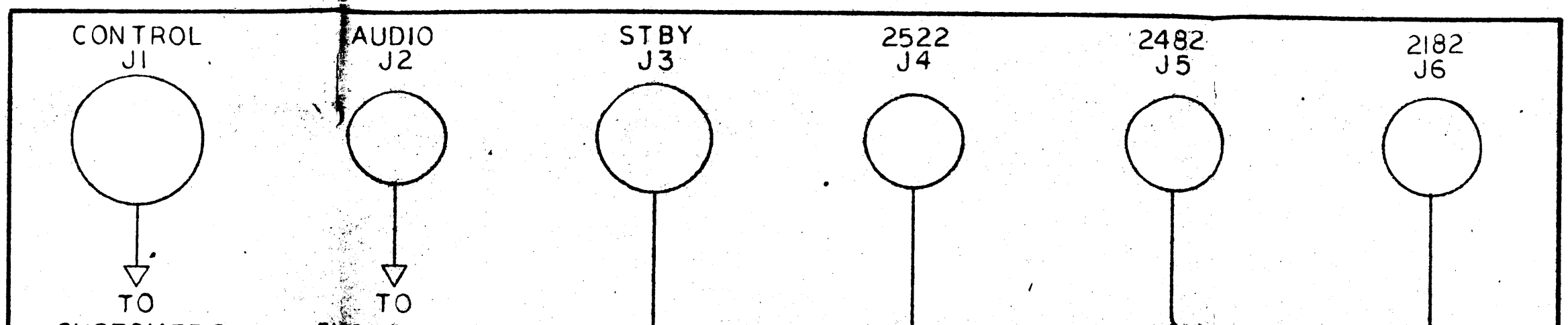
TB 1

3

28 T1 125


TB 1
3
2
1
2
5
4
24 V
48V
CR1
T1
28
14
0
28
14
0
125
115
105
0
F1
15a
1
3
K1

AX5158


CONTROL
J1
AUDIO
J2
STBY
J3
2522
J4
2482
J5
2182
J6
TO
TO
FROM
RACK A

TO CUSTOMERS WIRING

TO CUSTOMERS WIRING

FROM RACK A

CA1668-2

CA1668-1

POWER J7

A B C

PWR SPLY J8

A B C D E F

MATRIX J9

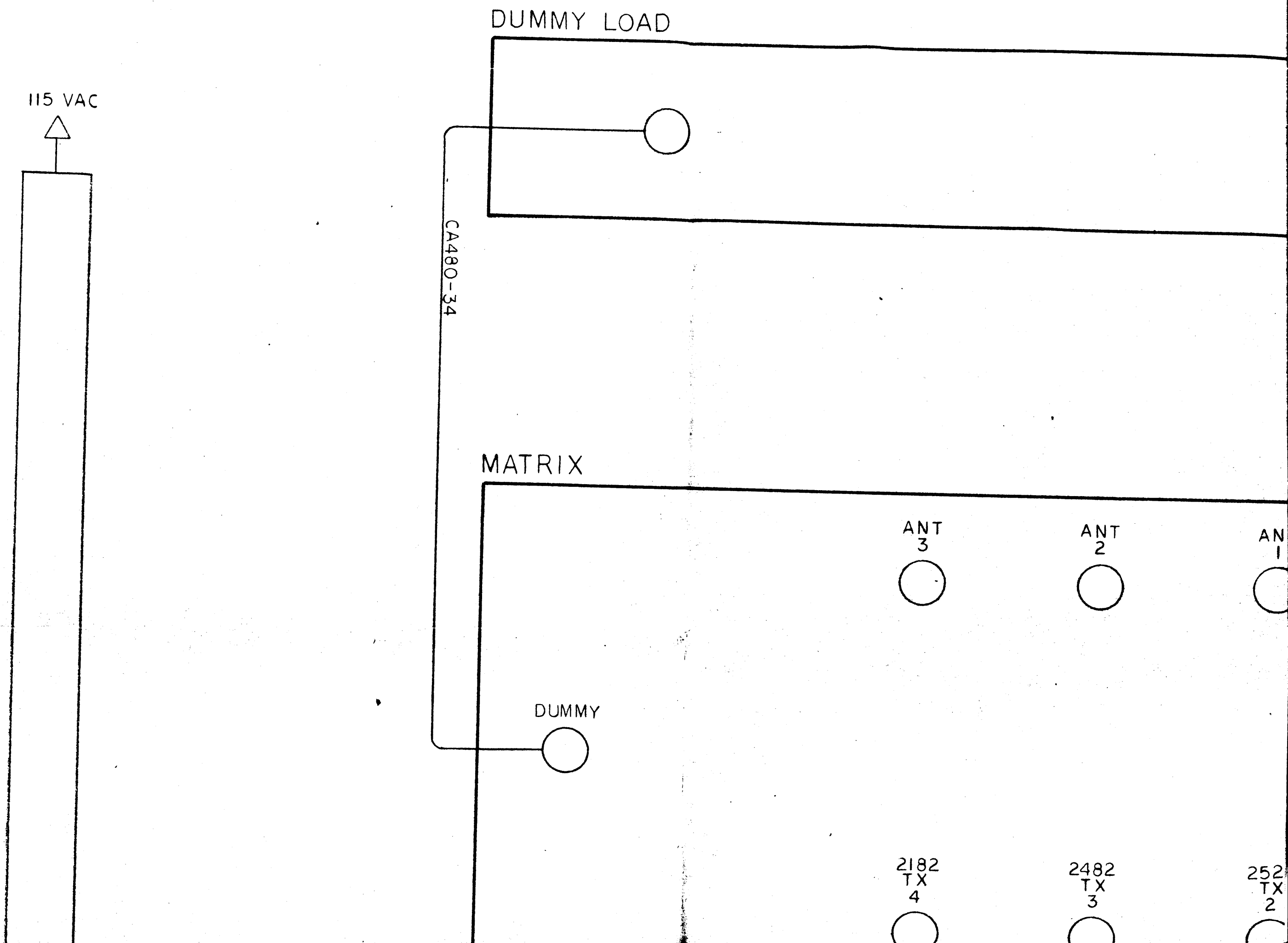
A B C D E F G H J K L M N P Q R S T U V W X Y Z

CA1665

CA1666

1 2 3 4 5

1 2 3 4 5 6 9 10 11 12 13 14 15 16 7 8


115 VAC
DUMMY LOAD
CA480-34
MATRIX
DUMMY
ANT 3
ANT 2
AN 1
2182 TX 4
2482 TX 3
252 TX 2

FROM
RACK C
2182 RF OUT
STBY RF OUT

TX
4

TX
3

2182
TURN
THRU
2482
TURN
THRU
2522
TURN
THRU

MOTOR
STBY/ANT 1
STBY/ANT 2
STBY/ANT 3
MANUAL
ROW A/COL 4
2522 / ROW B
2482 / ROW B
2182 / ROW B

COM

INDICATORS
TB 1
1 2 3 4 5 6 7 8 9 10 11
9 10 11 12 17 7

MOTORS
TB 2
1 2 3 4 5 6
1 2 3 4 5 6

STBY 2522 2482 2182

XMTR INTLKS
TB3
1 2 3 4 5 6 7 8
8 13 14 15 16

ANT 1

ANT INTLKS
TB4
1 2 3

CA1666

PWR SPLY

ZONE	LTR	DESCRIPTION	DATE	E.M.N.NO	DRAFT	CHK'D	APP'D

REVISIONS

CA575-5-12

PWR SPLY

TB1

2
5
4

3 — 24V
2 — 48V
1

CR1

T1

28
14
0
28
14
0

F1
15a

1
3

K1

AX5158

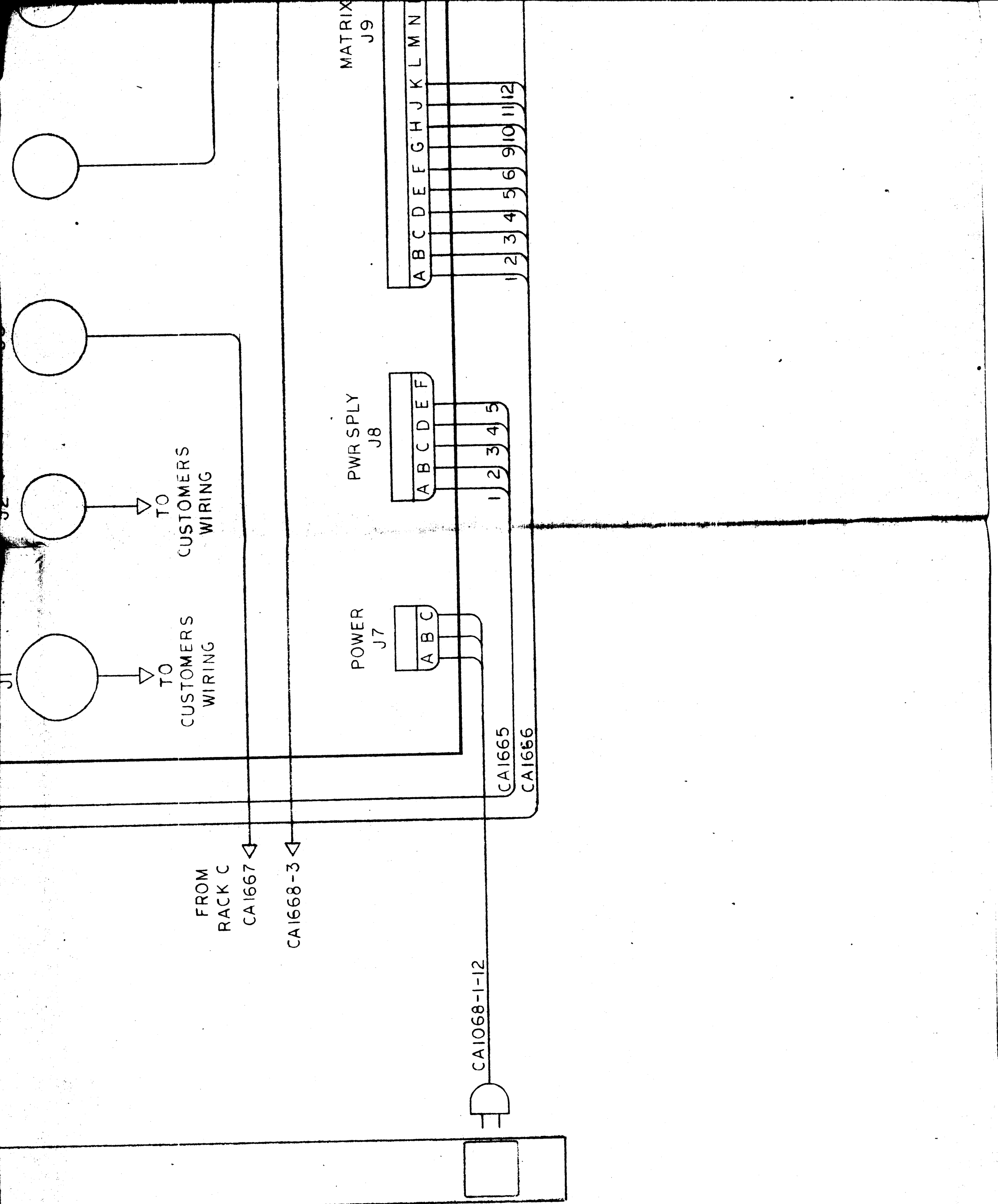
CONTROL J1

AUDIO J2

STBY J3

2522 J4

24



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CHECKED		DATE
DRAWN		DATE 1 Dec 71

THE TECHNICAL MATERIEL CORP.
MAMARONECK, NEW YORK

DIAGRAM, WIRING
TRANSMITTING SYSTEM
SYM 1203 RACK B

FIGURE 25

SIZE	CODE IDENT.NO.	DWG NO.	ISSUE
	82679	CK1924	

TPM-1K

J1 POWER

J2 RF IN

J3 RF OUT

J4 CONTROL

A B C D E F G

TB1 1 2 3 4 5 6 7 8 9 10

GND RF NC C NO +24 VDC RESET SWR NC C NO GND

CA480-36

CA480-92

CA1668-3

7 8 20

27 26 14 27 28 15 28

CA480-36

RFE-1 (2182)

LOW HIGH OUTPUT MON

J201

CA10136-110

CA480-5

CA480-91

J2 J1

LPF-750-3

STE-5A

RF OUT

600Ω OVEN A3H A3A GND PTT ALDC KEY ANTI-VOX A3J RCVR XMIT

TB1501 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

A C INPUT

CA480-5

CA1668-3

1R 1B 10 11 24 23 25 24 12 13 21 20 25

CA480-5

CA1668-3

1R 1B 10 11 24 23 25 24 12 13 21 20 25

TPM-1K

J1 POWER

J2 RF IN

J3 RF OUT

J4 CONTROL

A B C D E F G

TB1 1 2 3 4 5 6 7 8 9 10

GND RF NC C NO +24 VDC RESET SWR NC C NO GND

CA480-36

CA480-92

CA1667

10 11 49

65 64 39 65 66 40 66

CA480-36

RFE-2-4

LOW HIGH OUTPUT MON

J201

CA10136-110

CA480-5

CA480-91

TB201 1 2 3 4 5 6

CHAN 1 CHAN 2 CHAN 3 CHAN 4 +24 VDC

1 2 3 4 5

CA1664

LPF-750-3

J2

J1

CA480-91

AX5159

J1 CONTROL

A B C D E F G

J2 RF OUT EXC 1 EXC 2 EXC 3 EXC 4

J3 AMP

A B C D E F G

1 2 3 4 5

CA1664

CA480-5

CA480-5(4)

CA1667

16 17 18 64 39

1 2 3 4

CA480-5(4)

CA1667 16 17 18 64 15 19

1 2 3 4

1 2 3 4 5 CA1664

STE-5A (2522)

RF OUT

CA480-5 1

TB1501 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

600Ω OVEN A3H A3A GND PTT ALDC KEY ANTI-VOX A3J RCVR XMIT

AC INPUT

CA1667 1R 1B 26 27 62 61 63 62 28 38 49 48 63

STE-5A (2482)

RF OUT

CA480-5 2

TB1501 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

600Ω OVEN A3H A3A GND PTT ALDC KEY ANTI-VOX A3J RCVR XMIT

AC INPUT

CA1667 2R 2B 29 30 61 59 58 60 59 31 38 37 48 47 60

STE-5A (2182)

RF OUT

CA480-5 3

TB1501 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

600Ω OVEN A3H A3A GND PTT ALDC KEY ANTI-VOX A3J RCVR XMIT

AC INPUT

CA1667 3R 3B 32 33 58 56 55 57 56 34 37 36 47 46 57

STE-5A (SPARE)

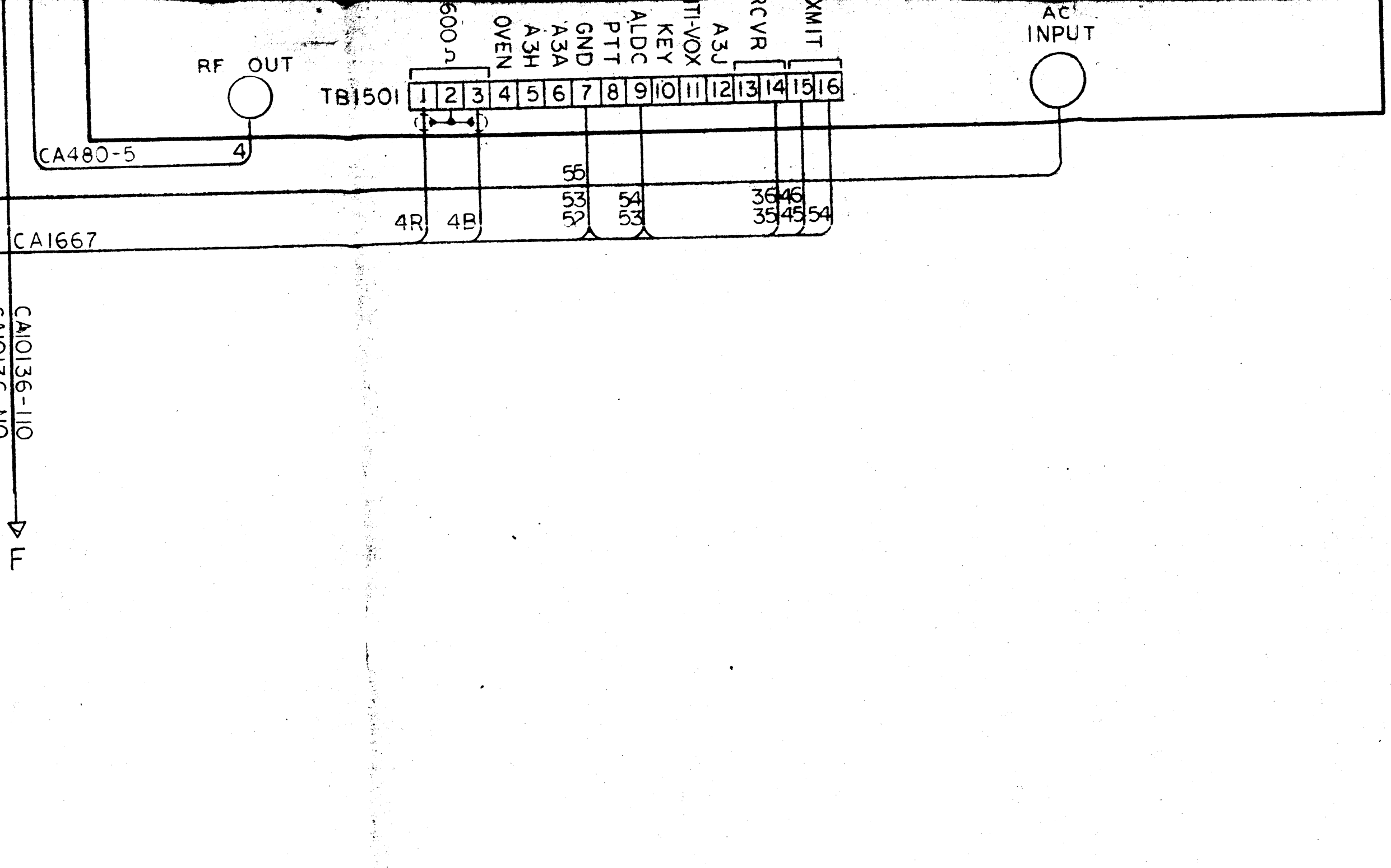
RF OUT

CA480-5 4

TB1501 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

600Ω OVEN A3H A3A GND PTT ALDC KEY ANTI-VOX A3J RCVR XMIT

AC INPUT


RF OUT
TB1501
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
600Ω
A3H OVEN
A3A
GND
PTT
ALDC
KEY
A3J
MULTI-VOX
RCVR
XMIT
AC INPUT
CA480-5
4
55
53
52
54
53
36
35
46
45
54
4R
4B
CA1667
CA10136-110
F

TPM-1K

115 VAC

CA581-2

J1
POWER

J2
RF IN

J3
RF OUT

J4
CONTROL

A B C D E F G

CA480-36

CA480-92

7 8 20

CA1668-3

RFE-1 (2182)

LOW

HIGH

OUTPUT

J201

CA10136-110

CA480-5

STE-5A

RF OUT

CA480-5

600Ω
OVEN
A3H
A3A
GND
PTT
ALDC
KEY
ANTI-VOX
A3J
RCVR
XMIT

B1501 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

CA555-3

CA555-3

CA581-2

CA480-5

CA1668-3

1R 1B 10 11 24 23 25 24 12 13 21 20 25

TPM-1K

J1 POWER

J2 RF IN

J3 RF OUT

J4 CONTROL

A B C D E F G

CA480-36

CA480-92

CA1667

10 11 49

RFE-2-4

LOW HIGH OUTPUT MON

J201

CA10136-110

CA480-5

CA480-91

AX5159

J1 CONTROL

A B C D E F G

J2 RF OUT EXC 1 EXC 2 EXC 3

CA480-5

CA480-5(4)

1 2 3

STE-5A (SPARE)

RF OUT

600Ω

OVEN

A3H

A3A

GND

PTT

ALDC

KEY

ANTI-VOX

A3J

RC VR

XMIT

CA480-5

3

CA1667

3R 3B 32 33 35 56 34 36 37 46 47 57

CA555-3

STE-5A (2182)

TB1501

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

2R 2B 29 30 58 59 60 31 38 48 47 60

2

STE-5A (2482)

1R 1B 26 27 62 63 28 38 48 49 63

1

STE-5A (2522)

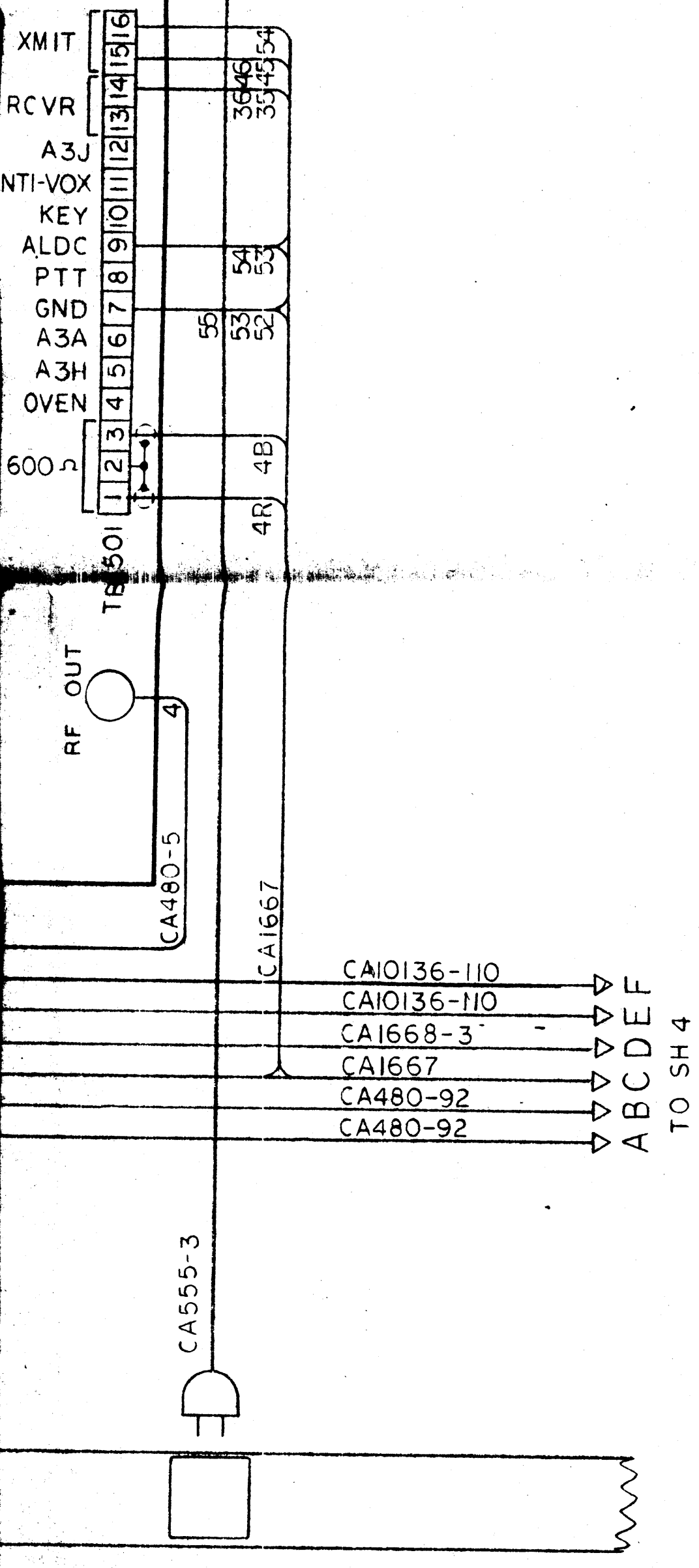
15 19 64 16 17 18

CA480-5 (4)

A B C D E G

1 2 3 4

REVISIONS						
ZONE	LTR	DESCRIPTION	DATE	E.M.N.NO	DRAFT	CHKD	APPD



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CHECKED		DATE
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THE TECHNICAL MATERIEL CORP.
MAMARONECK, NEW YORK

DIAGRAM, WIRING
TRANSMITTING SYSTEM
SYM 1203 RACK C

Figure 25

SIZE	CODE IDENT NO.	DWG NO.	ISSUE
	82679	CK1924	

TO SH 3

A B C D E F

CA430-92

CA490-92

CA1657

CA1668-3

CA10136-110

CA10136-110

PSP-500

PLATE ON-OFF

ANT RELAY

REM INTLKS

TB101 1 2 3 4 5 6

J101

P2

J102

18 21 2 3 6 8

CA1668-3

CA10136-110

CA1668-3 18 21 2 3 6 8
CA10136-110

AX5138

NC C NO + −
TB 2 6 5 4 3 2 1

NC NO C 115V
TB1 6 5 4 3 2 1

23
22 17 19 16
CA1668-3

7 6 5 4

PSP-500

PLATE ON-OFF | ANT RELAY | REM INTLKS
TB101 1 2 3 4 5 6

J101 P2

J102

43 43 5 6 9 11
CA1667
CA10136-110

AX5138

NC C NO + −
TB2 6 5 4 3 2 1

NC NOC 115V
TB 1 6 5 4 3 2 1

CA1667
51 42 44 41

10 9 8 7

CA1668-3

TB2
4
5
7

F3
1/2 a

M B3

TO J6 AX5158
SYSTEM CONTROL

19	T	24 VDC
18	S	PV ON
3	R	PV ON IND
2	P	PV ON IND
	N	
17	M	PWR ON IND
16	L	PWR ON
15	K	VSWR IND
14	J	RF IND
22, 26	H	GND
13	G	CARR ON IND
12	F	A3J
11	E	A3A
10	D	A3H
	C	
1B	B	AUDIO
1R	A	

TO J3 AX5158
SYSTEM CONTROL

19, 51	s	GND	
	r		
	p		
	n		
18	m	2182	CHAN SEL
17	k	2482	
16	j	2522	
15, 44	h	24 VDC	
43	g	PV ON	
6	f	PV ON IND	
5	e	PV ON IND	
42	d	PWR ON IND	
41	c	PWR ON	
40	b	VSWR IND	
39	a	RF IND	
35	Z	CARR ON IND	
34	Y	A3J	2182
33	X	A3A	
32	W	A3H	
31	V	A3J	2482
30	R	A3A	
29	P	A3H	
28	N	A3J	2522
27	J	A3A	
26	H	A3H	
4B	U	SPARE AUDIO	
4R	T		
3B	S	2182 AUDIO	MODE SEL
3R	M		
2B	L	2482 AUDIO	
2R	K		
1B	G	2522 AUDIO	
1R	F		
	E		
	C		
	B		
	A		

B4

M

F4
1/2

TB2: 1 2 3 4

4 5 7 8

CA1668-3

CA1667

CA1667

TO TX4 MATRIX

CA480-92

TO SH 3

A B C D E F

CA4330-92

CA4990-92

CA1657

CA1669-3

CA10136-110

CA10136-110

PSP-500

PLATE ON-OFF

ANT RELAY

REM INTLKS

TB101 1 2 3 4 5 6

J101

P2

J102

18 21 2 3 6 8

CA1668-3

CA10136-110

CA1668-3 18 21 2 3 6 8
CA10136-110

AX5138

P1

NC C NO + −
TB 2 6 5 4 3 2 1

23
22 17 19 16

CA1668-3

PSP-500

REM INTLKS
ANT RELAY
PLATE ON-OFF

TB101 1 2 3 4 5 6

J101 P2

J102

CA1667 43 45 5 6 9 11
CA10136-110

AX5138

P1

NC C NO + −
TB 2 6 5 4 3 2 1

CA1667 51 42 44 41

CA1668-3

TB2
4
5
7

F3
1/2 a

M B3

SYSTEM CONTROL

GND

CHAN SEL
- 2182
- 2482
- 2522

24VDC

PV ON

PV ON IND

PV ON IND

PWR ON IND

PWR ON

VSWR IND

RF IND

CARR ON IND

MODE SEL
- 2182: A3J, A3A, A3H
- 2482: A3J, A3A, A3H
- 2522: A3J, A3A, A3H

SPARE AUDIO

2182 AUDIO

2482 AUDIO

2522 AUDIO

CA1667

CA1668-3

CA1667

B4

M

F4 1/2a

TB2 1 2 3 4

4 5 7 8

TO TX4 MATRIX

CA480-92

TO TX1 MATRIX

CA480-92

REVISIONS							
ZONE	LTR	DESCRIPTION	DATE	E.M.N.NO	DRAFT	CHKD	APPD

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ELECT DES.		DATE 1 Dec 71
CHECKED		DATE
DRAWN		DATE 1 Dec 71

THE TECHNICAL MATERIEL CORP.
MAMARONECK, NEW YORK

DIAGRAM, WIRING
TRANSMITTING SYSTEM
SYM 1203 RACK C

Figure 25

SIZE	CODE IDENT.NO.	DWG NO.	ISSUE
	82679	CK 1924	

8 7 6

D

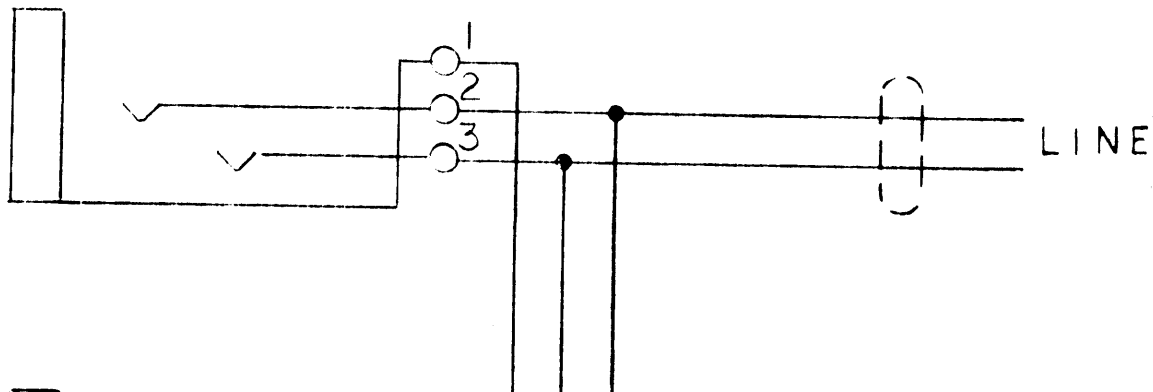
	2522 CONTROL				2522 INDICATORS						STBY CHAN SEL		
MON	J1	J3	J5	J7	J9	J11	J13	J15	J17	⊗	J21	J23	J25
	J2	J4	J6	J8	J10	J12	J14	J16	J18	⊗	J22	J24	J26
	PWR	A3H	A3A	A3J	PWR	PV	CARR	RF	SWR		2522	2482	2182

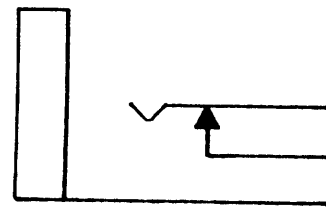
C

	2482 CONTROL				2482 INDICATORS								
MON	J1	J3	J5	J7	J9	J11	J13	J15	J17	⊗	⊗	⊗	⊗
	J2	J4	J6	J8	J10	J12	J14	J16	J18	⊗	⊗	⊗	⊗
	PWR	A3H	A3A	A3J	PWR	PV	CARR	RF	SWR				

	2182 CONTROL				2182 INDICATORS								
MON	J1	J3	J5	J7	J9	J11	J13	J15	J17	⊗	⊗	⊗	⊗
	J2	J4	J6	J8	J10	J12	J14	J16	J18	⊗	⊗	⊗	⊗
	PWR	A3H	A3A	A3J	PWR	PV	CARR	RF	SWR				

B





5 4

A1

AN SEL		STBY CHAN IND		NORM AUDIO	STBY AUDIO
J25 ⊗ ⊗	J31	J33	J35 ⊗	J39	J41 J43	J45	J47	J49	J51
J26 ⊗ ⊗	J32	J34	J36 ⊗	J40	J42 J44	J46	J48	J50	J52
2182		2522 2482 2182		2522 2482 2182	2522 2482 2182 SPARE

MON

A2

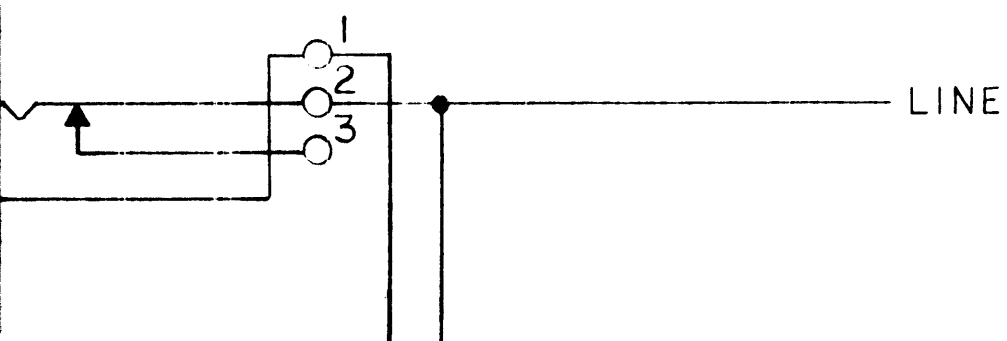
STBY CONTROL	2522	2482	2182
⊗ ⊗ ⊗ ⊗ ⊗ J33	J35	J37	J39	J41	J43	J45	J47	J49	J51
⊗ ⊗ ⊗ ⊗ ⊗ J34	J36	J38	J40	J42	J44	J46	J48	J50	J52
	PWR	A3H A3A A3J	A3H A3A A3J	A3H A3A A3J

MON

A3

STBY INDICATORS									
⊗ ⊗ ⊗ ⊗ ⊗ J33	J35	J37	J39	J41	J43	J45	J47	⊗	⊗
⊗ ⊗ ⊗ ⊗ ⊗ J34	J36	J38	J40	J42	J44	J46	J48	⊗	⊗
	PWR	PV	CARR	RF	SWR	A3H	A3A	A3J	

MON



REVISIONS							
E.M.N.NO	DRAFT	CHKD	ZONE	LTR	DESCRIPTION	DATE	APPROVED

	A1
FROM	TO
J1	J1-d
J2	J4-L
J3	XK12-11
J4	J4-D
J5	XK12-8
J6	J4-E
J7	XK12-5
J8	J4-F
J9	J4-M
J10	J1-e
J11	XK1-4
J12	XK5-8
J13	J4-G
J14	XK5-11
J15	J4-J
J16	XK5-5
J17	J4-K
J18	J1-h
J21	J1-l
J22	XK15-1
J23	J1-m
J24	XK16-1
J25	J1-p
J26	XK17-1
J31	XK12-16
J32	J1-s
J33	XK13-16
J34	J1-t
J35	XK14-16
J36	J1-u
J39	XK22-5,8
J40	J4-A,B,C
J41	XK23-5,8
J42	J5-A,B,C
J43	XK24-5,8
J44	J6-A,B,C
J45	XK22-7,10
J46	J3-A,B,C
J47	XK23-7,10
J48	J3-E,F,G
J49	XK24-7,10
J50	J3-K,L,M
J51	J2-J,K,L
J52	J3-S,T,U

	A2
FROM	TO
J1	J1-S
J2	J5-L
J3	XK13-11
J4	J5-D
J5	XK13-8
J6	J5-E
J7	XK13-5
J8	J5-F
J9	J5-M
J10	J1-T
J11	XK2-4
J12	XK6-8
J13	J5-G
J14	XK6-11
J15	J5-J
J16	XK6-5
J17	J5-K
J18	J1-W
J33	J1-2
J34	J3-c
J35	XK12-13
J36	J3-D
J37	XK12-10
J38	J3-H
J39	XK12-7
J40	J3-J
J41	XK13-13
J42	J3-N
J43	XK13-10
J44	J3-P
J45	XK13-7
J46	J3-R
J47	XK14-13
J48	J3-V
J49	XK14-10
J50	J3-W
J51	XK14-7
J52	J3-X

	A3
FROM	TO
J1	J1-F
J2	J6-L
J3	XK14-11
J4	J6-D
J5	XK14-8
J6	J6-E
J7	XK14-5
J8	J6-F
J9	J6-M
J10	J1-G
J11	XK3-4
J12	XK7-8
J13	J6-G
J14	XK7-11
J15	J6-J
J16	XK7-5
J17	J6-K
J18	J1-K
J33	J3-d
J34	J1-z
J35	XK4-4
J36	J1-3
J37	J3-Z
J38	XK7-13
J39	J3-a
J40	J1-4
J41	J3-b
J42	J1-5
J43	A4-11
J44	J1-w
J45	A4-17
J46	J1-x
J47	A4-5
J48	J1-y

MON

MON

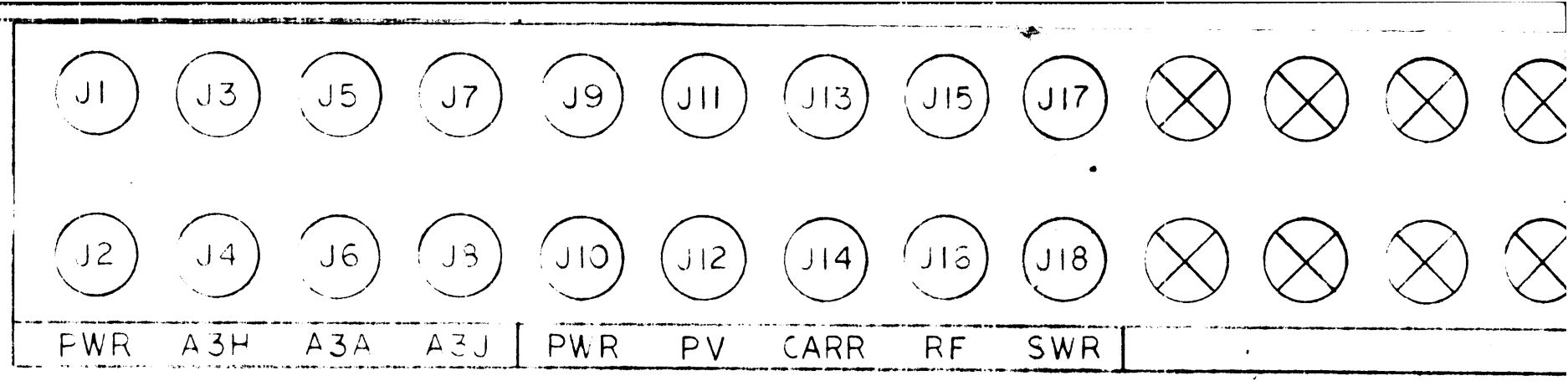
MON

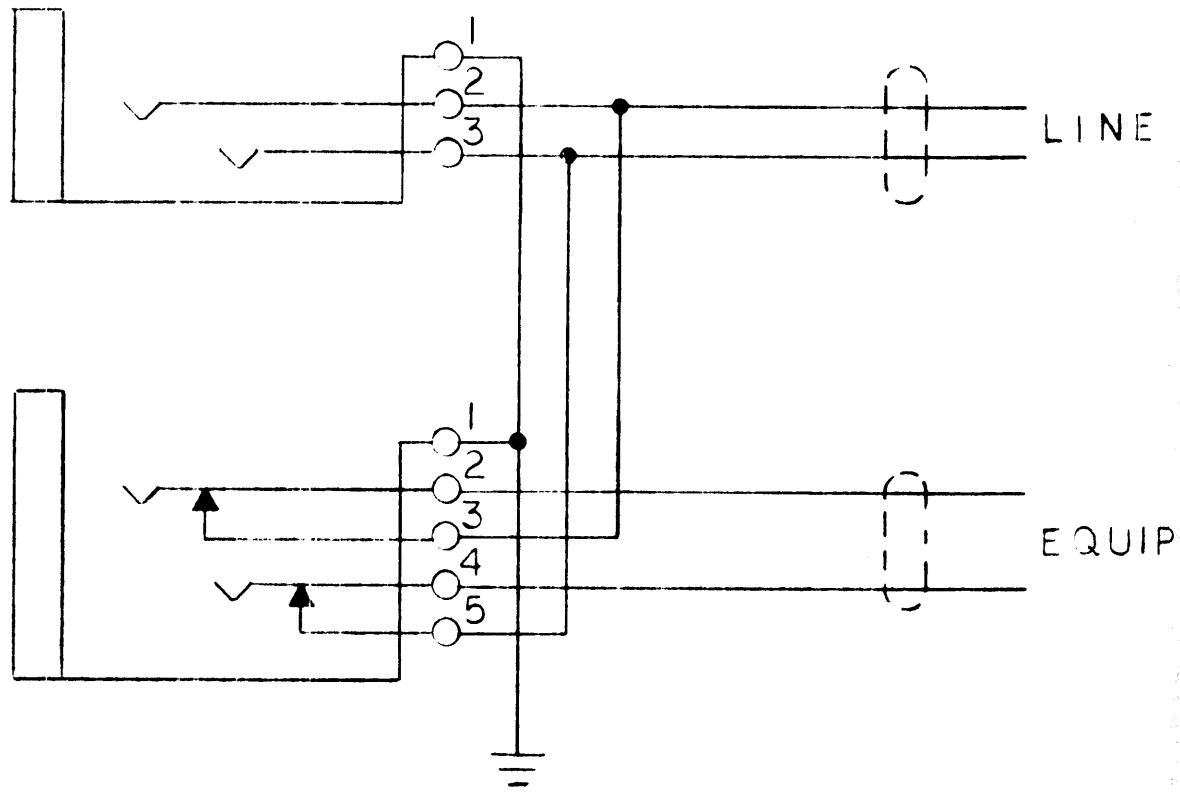
D

C

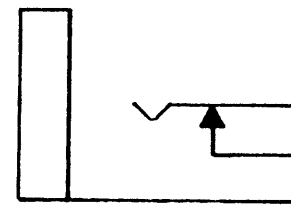
B

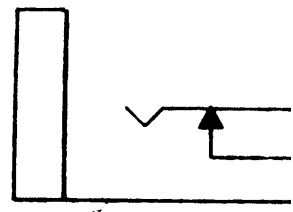
CK1923 A1



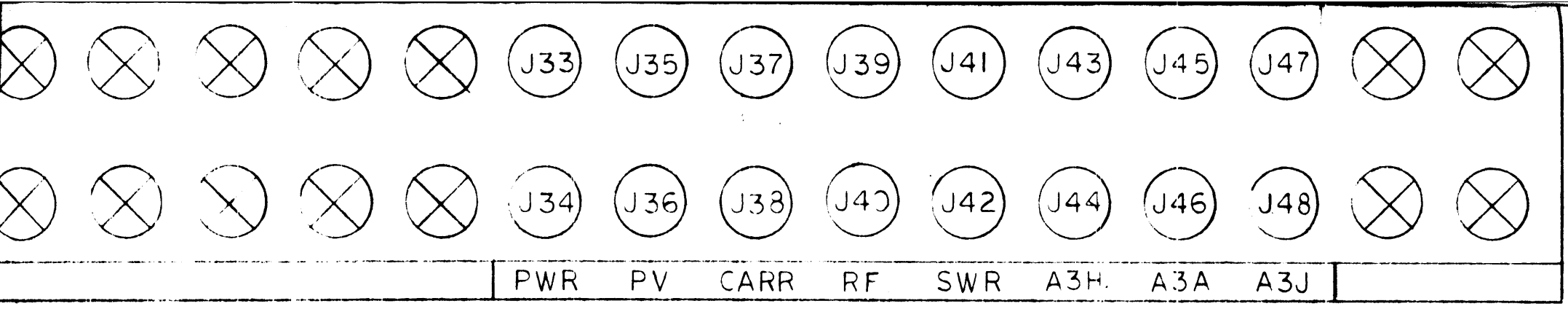


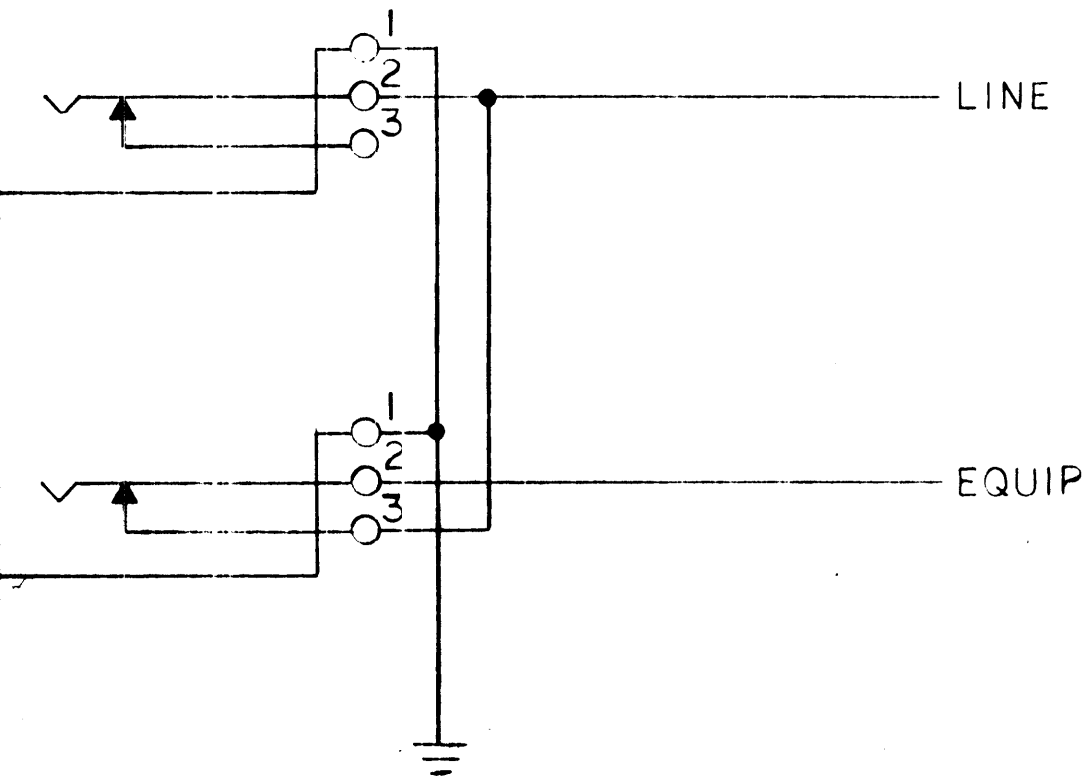
TYPICAL AUDIO JACK CIRCUIT





TYPIC





TYPICAL DC JACK CIRCUIT

	SYM 1203	AX 5158
QTY / UNIT	MODEL USED ON	ASS'Y NO.
APPLICATION		
	CODE	

6 5 4

J42	J3-A,B,C
J43	XK24-5,8
J44	J6-A,B,C
J45	XK22-7,10
J46	J3-A,B,C
J47	XK23-7,10
J48	J3-E,F,G
J49	XK24-7,10
J50	J3-K,L,M
J51	J2-J,K,L
J52	J3-S,T,U

J48	J3-V
J49	XK14-10
J50	J3-W
J51	XK14-7
J52	J3-X

J48	J1-y

B

CK1923 A

QTY. REQ.	ITEM	PART NO.	DESCRIPTION	SYMBOL

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES

TOLERANCES ON

DECIMALS	FRACTIONS
.X ± .05	± 1/64
.XX ± .01	ANGLES
.XXX ± .005	± 0° -30'

MATERIAL

FINISH

FINAL APPROVAL		DATE 30 Nov 71
MECH. DES.		DATE
ELECT. DES.		DATE 30 Nov 71
CHECKED		DATE
DRAWN		DATE 29 Nov 71

THE TECHNICAL MATERIEL CORP.
MAMARONECK, NEW YORK

DIAGRAM, SCHEMATIC

SYSTEM CONTROL UNIT

Figure 2.6

SIZE	CODE IDENT NO.	DWG NO.	ISSUE
D	82679	CK1923	A

SCALE | SHEET 1 OF 3

3 2 1

2-14

8 7 6

D

C

B

J2
AUDIO

2522
AUDIO

SPARE

2482
AUDIO

2182
AUDIO

G
I
H
J
K
L
M
N
D
F
E
A
C
B

A1J51-3
A1J51-2

ALL SHIELDS
GROUNDED
AT RELAYS

K22
K23
K24

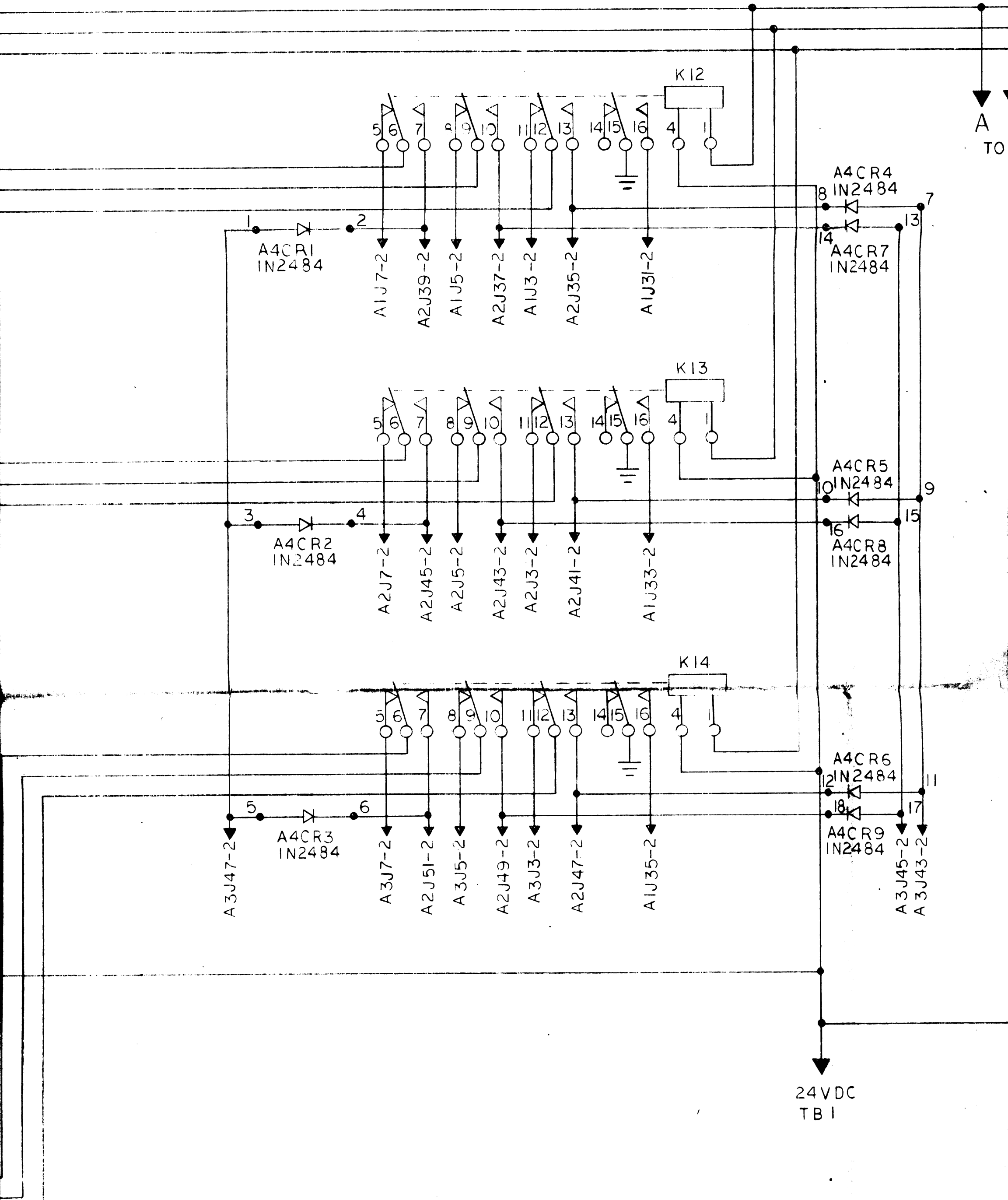
5 6 7 8 9 10 4 1

A1J39-3
A1J45-3
A1J39-2
A1J45-2
A1J41-3
A1J47-3
A1J41-2
A1J47-2
A1J43-3
A1J49-3
A1J43-2
A1J49-2

P/O
J1
CONTROL

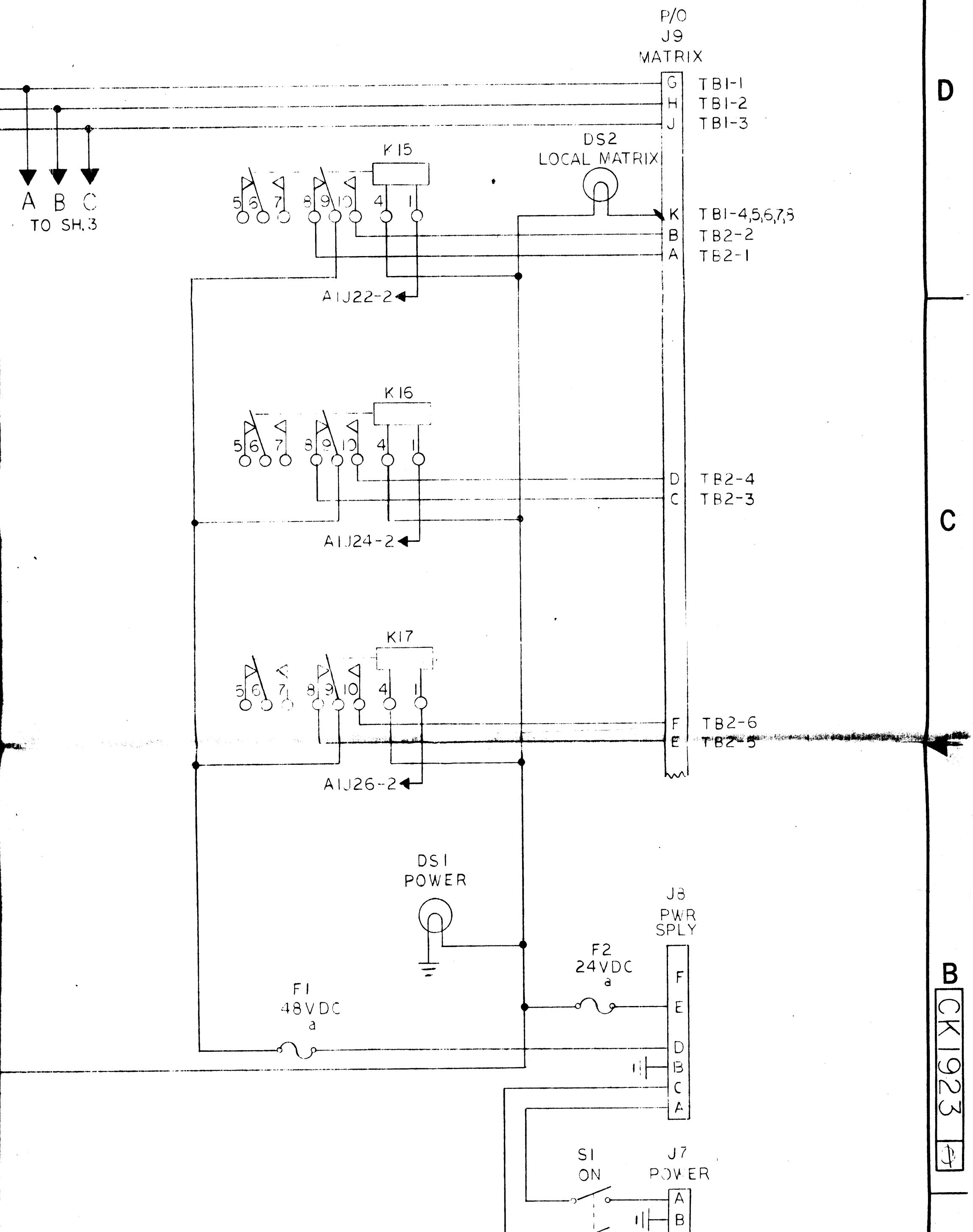
STBY XMTR CHAN SEL	COM	k	
	2522	l	A1J21-2
	2432	m	A1J23-2
	2182	p	A1J25-2
STBY XMTR CHAN IND	2522	s	A1J32-2
	2482	t	A1J34-2
	2182	u	A1J36-2
STBY XMTR MODE IND	A3H	w	A3J44-2
	A3A	x	A3J46-2
	A3J	y	A3J48-2
2522 MODE SEL	A3J	b	
	A3A	a	
	A3H	Z	
	COM	Y	
2432 MODE SEL	A3J	P	
	A3A	Q	
	A3H	N	
	COM	M	
2182	A3J	D	
	A3A	C	

5 4


K12
A4CR1 IN2484
A4CR4 IN2484
A4CR7 IN2484
A1J7-2
A2J39-2
A1J5-2
A2J37-2
A1J3-2
A2J35-2
A1J31-2
K13
A4CR2 IN2484
A4CR5 IN2484
A4CR8 IN2484
A2J7-2
A2J45-2
A2J5-2
A2J43-2
A2J3-2
A2J41-2
A1J33-2
K14
A4CR3 IN2484
A4CR6 IN2484
A4CR9 IN2484
A3J47-2
A3J7-2
A2J51-2
A3J5-2
A2J49-2
A3J3-2
A2J47-2
A1J35-2
A3J45-2
A3J43-2
24VDC
TB1

3	2	1

REVISIONS							
E.M.N.NO	DRAFT	CHKD	ZONE	LTR	DESCRIPTION	DATE	APPROVED
				X		4/1/71	

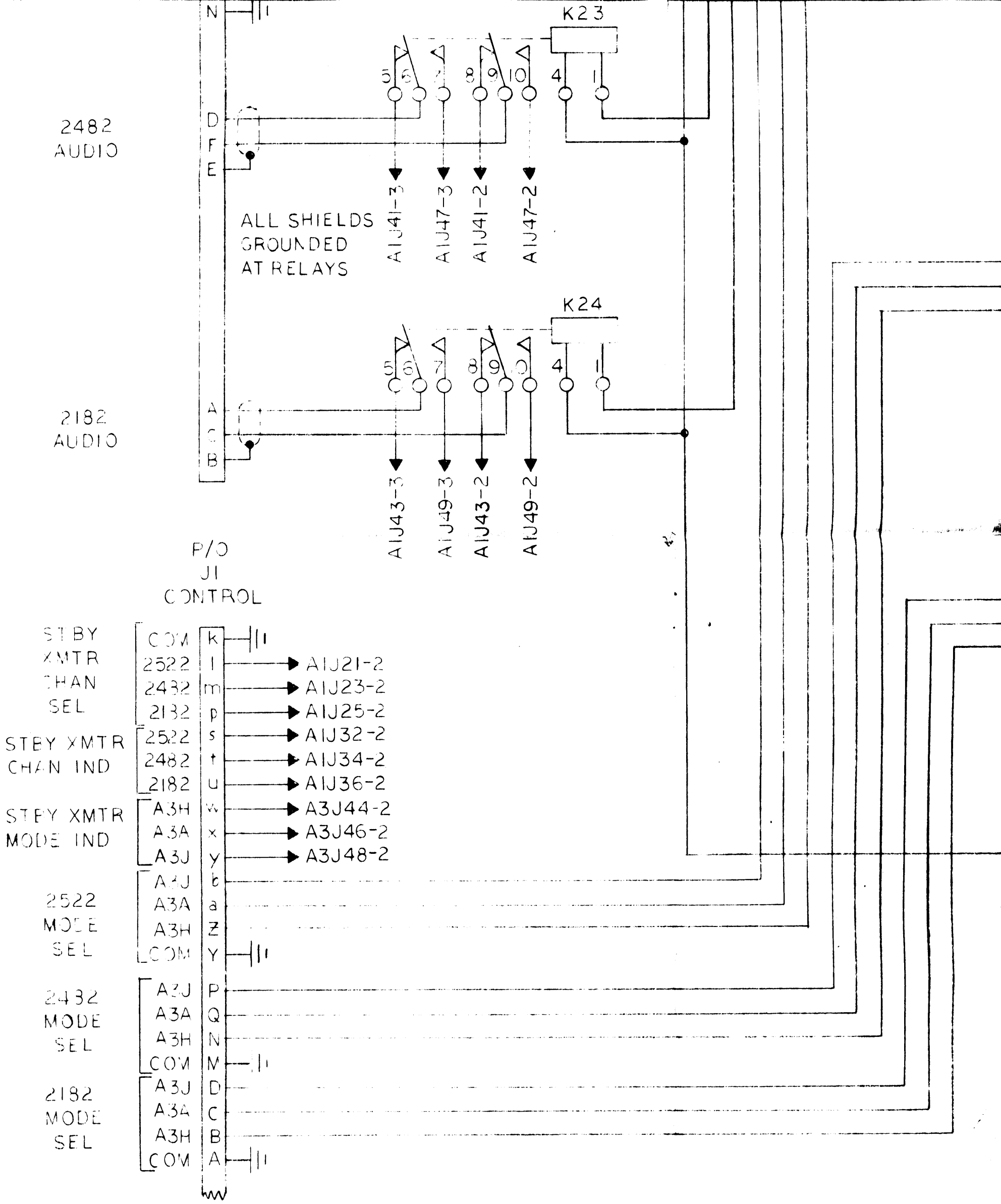


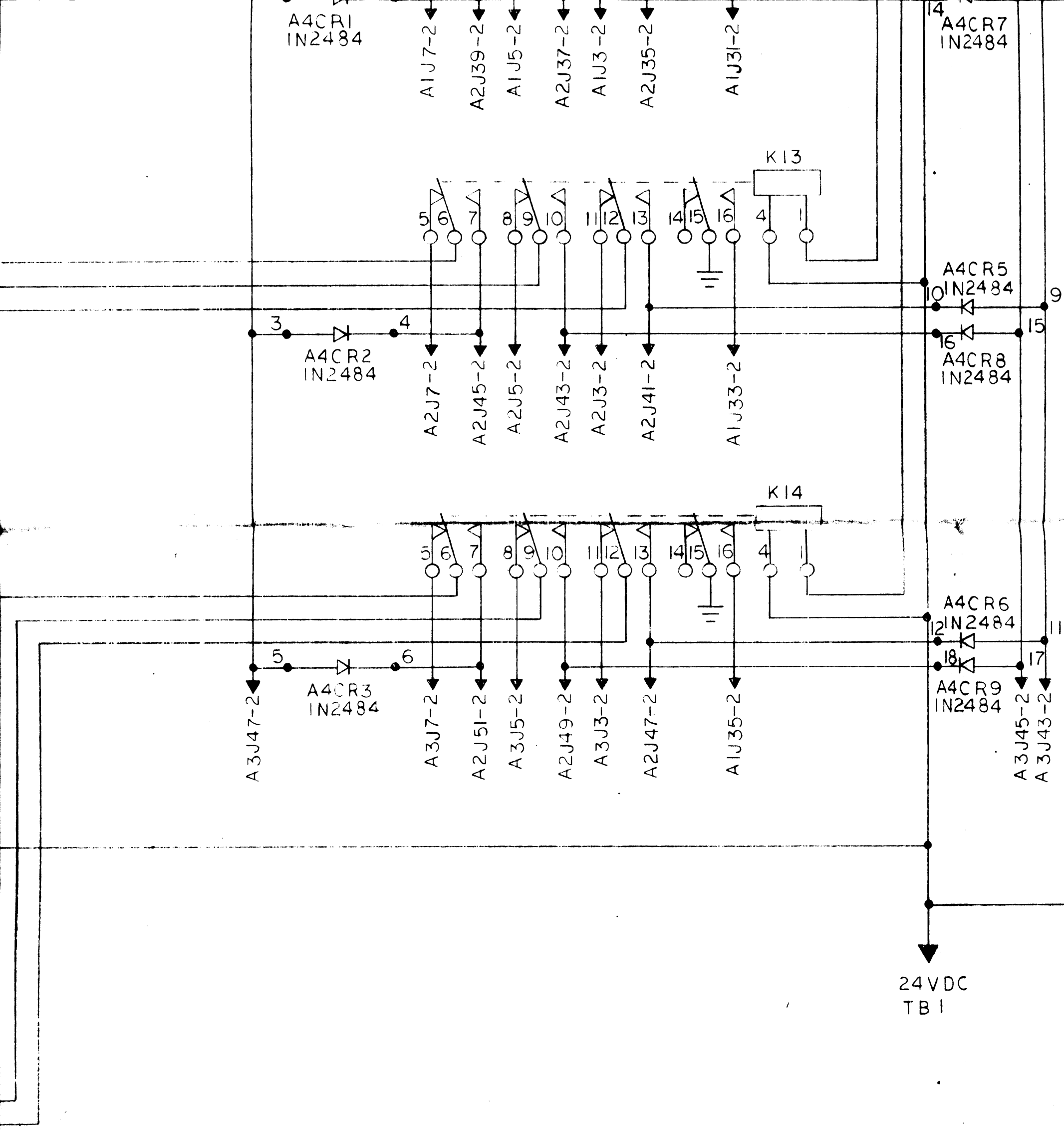
D

C

B

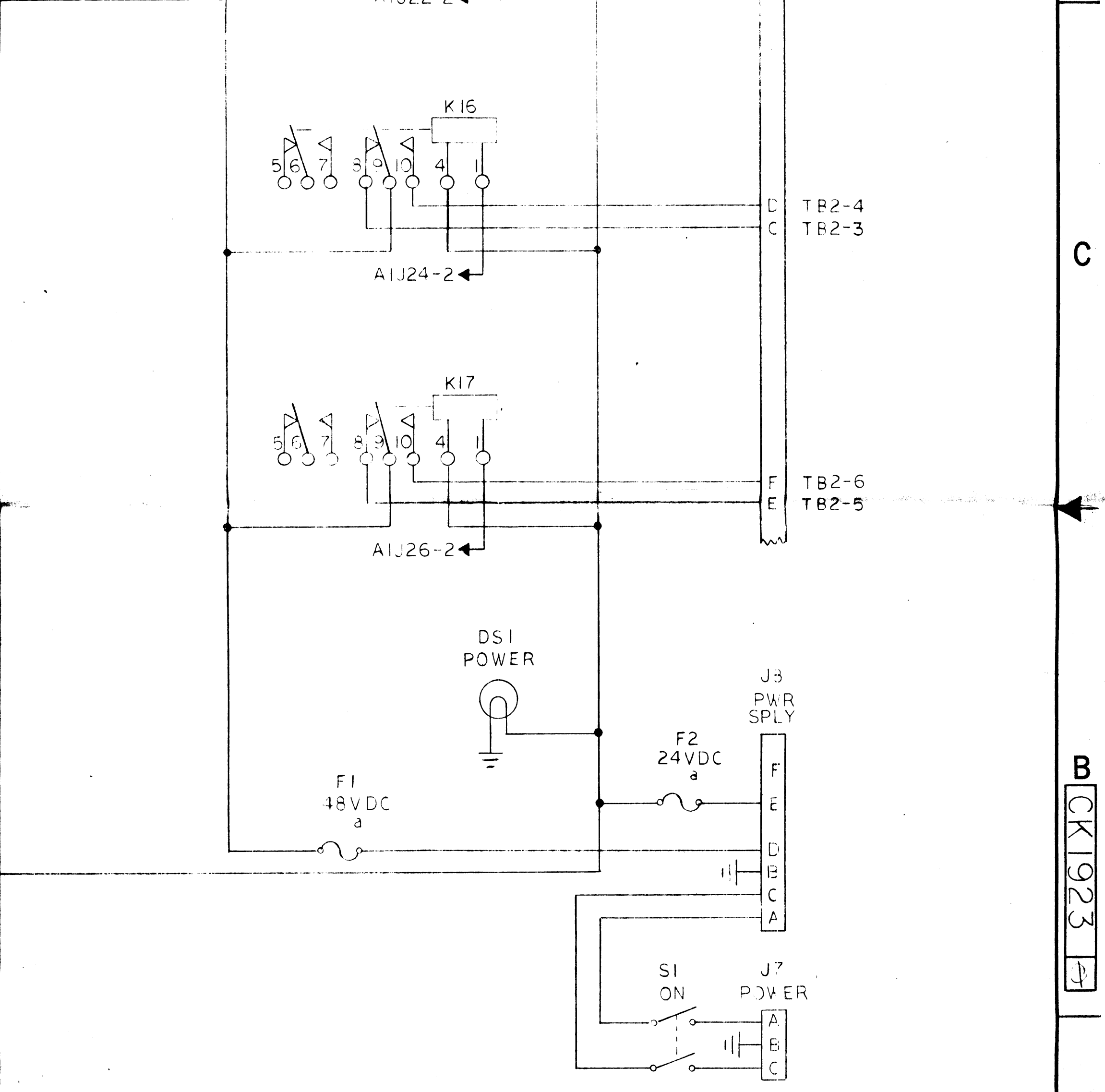
CK1923


2482 AUDIO
2182 AUDIO
K23
K24
ALL SHIELDS GROUNDED AT RELAYS
A1J41-3
A1J47-3
A1J41-2
A1J47-2
A1J43-3
A1J49-3
A1J43-2
A1J49-2
P/O J1 CONTROL
STBY XMTR CHAN SEL
COM
2522
2432
2182
STBY XMTR CHAN IND
STBY XMTR MODE IND
2522 MODE SEL
2432 MODE SEL
2182 MODE SEL
A1J21-2
A1J23-2
A1J25-2
A1J32-2
A1J34-2
A1J36-2
A3J44-2
A3J46-2
A3J48-2



	SYM 1203	AX5158
QTY / UNIT	MODEL USED ON	ASS'Y NO.
APPLICATION		
	CODE	

5 4



QTY. REQ.	ITEM	PART NO.	DESCRIPTION	SYMBOL

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES

TOLERANCES ON

DECIMALS	FRACTIONS
.X ± .05	± 1/64
.XX ± .01	ANGLES
.XXX ± .005	± 0° -30'

MATERIAL

FINISH

		DATE
FINAL APPROVAL	[illegible]	30 Nov 71
MECH. DES.		DATE
ELECT. DES.	[illegible]	DATE 30 N[illegible]
CHECKED		DATE
DRAWN	[illegible]	DATE 29 Nov 71

THE TECHNICAL MATERIEL CORP.
MAMARONECK, NEW YORK

DIAGRAM, SCHEMATIC

SYSTEM CONTROL UNIT

Figure 26.

SIZE	CODE IDENT NO.	DWG NO.	ISSUE
D	82679	CK1923	(illegible)

SCALE

SHEET 2 OF 3

NO.

hereon. or used DRATION

B

CK1923 (illegible)

A

C

3 2 1

2-15

8 | 7 | 6

D

C

B

A

P/O
J1
CONTROL

2522
RF IND g
PV ON IND f
CARR ON IND c

2482
RF IND V
PV ON IND U
CARR ON IND R

2182
RF IND J
PV ON IND H
CARR ON IND E

STBY
RF IND 4
PV ON IND 3

j
X
6

K5
K6
K7

TO SH.2 A
TO TB1 24VDC
TO SH.2 B
TO SH.2 C

A1J16-2
A1J12-2
A1J14-2
A2J16-2
A2J12-2
A2J14-2
A3J40-2
A3J36-2
A3J16-2
A3J12-2
A3J14-2
A3J38-2

PWR ON IND
2522 d → A1J1-2
2482 S → A2J1-2
2182 F → A3J1-2
STBY 2 → A2J33-2

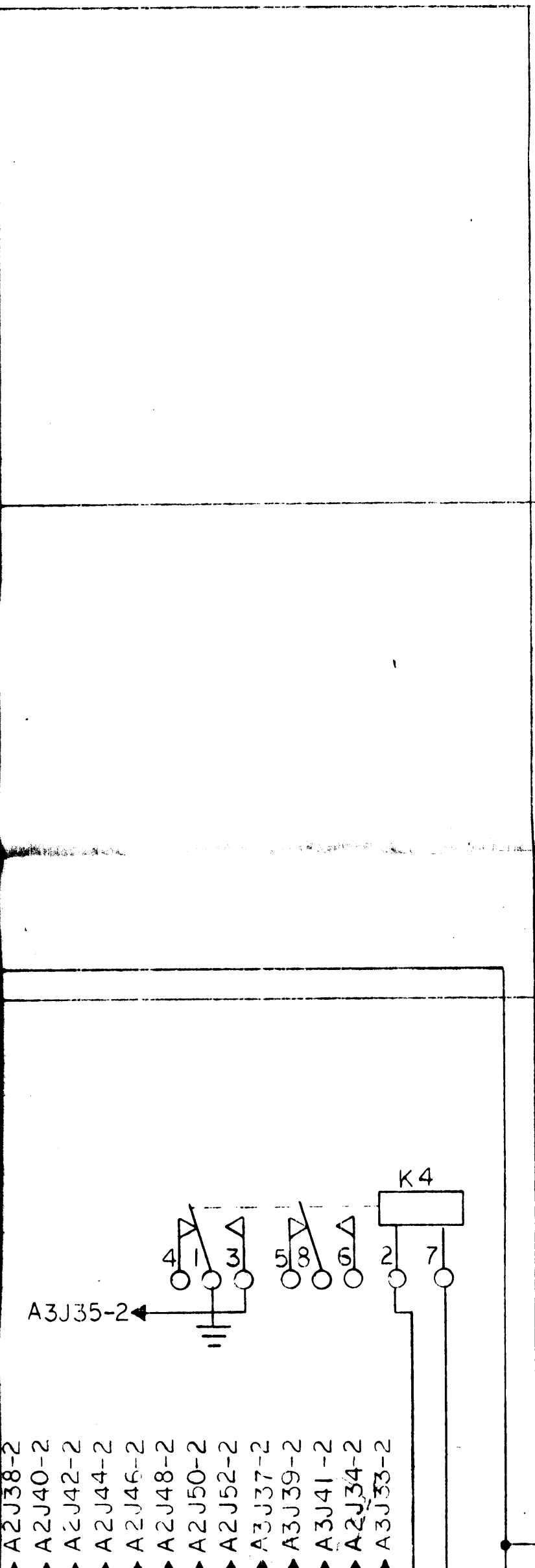
PWR ON IND
2522 e → A1J10-2
2482 T → A2J10-2
2182 G → A3J10-2
STBY z → A3J34-2

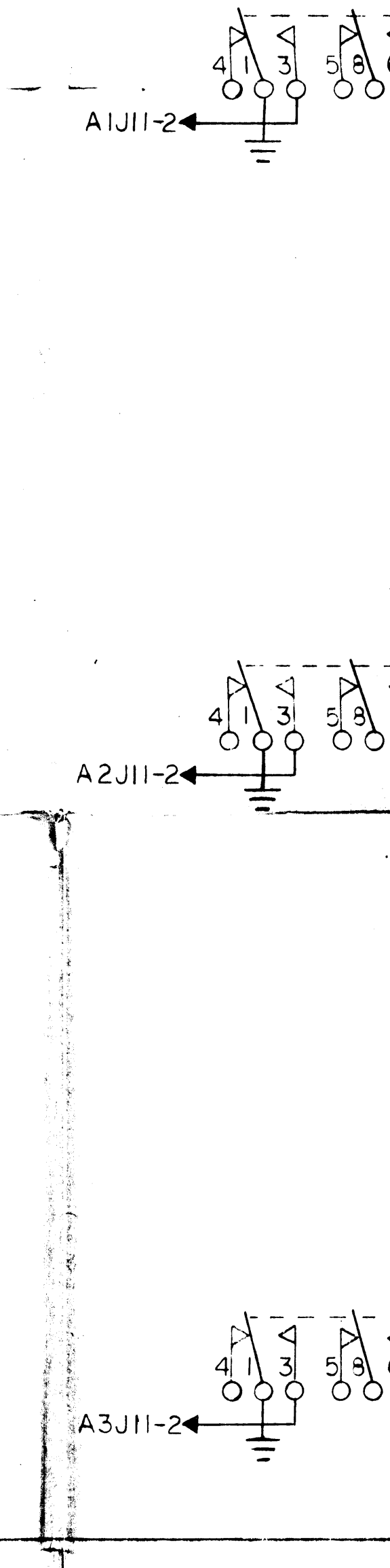
VSWR
2522 h → A1J18-2

A1J46-4
A1J45-2
A1J48-4
A1J48-2
A1J50-4
A1J50-2
A1J52-4
A1J52-2
A2J36-2
A2J38-2
A2J40-2

5 4 3

C


K4
4
1
3
5
8
6
2
7
A3J35-2
A2J38-2
A2J40-2
A2J42-2
A2J44-2
A2J46-2
A2J48-2
A2J50-2
A2J52-2
A3J37-2
A3J39-2
A3J41-2
A2J34-2
A3J33-2


4
1
3
5
8
A1J11-2
A2J11-2
A3J11-2

3 2 1

REVISIONS							
E.M.N.NO	DRAFT	CHKD	ZONE	LTR	DESCRIPTION	DATE	APPROVED
				3			

J4
2522
XMTR

A1J40-4	A	
	B	AUDIO
A1J40-2	C	
A1J4-2	D	A3H
A1J6-2	E	A3A
A1J8-2	F	A3J
A1J13-2	G	CARR ON IND
	H	
A1J15-2	J	RF IND
A1J17-2	K	VSWR IND
A1J2-2	L	PWR ON
A1J9-2	M	PWR ON IND
	N	
	P	PV ON IND
	R	PV ON IND
	S	PV ON
	T	24VDC

J5
2482
XMTR

A1J42-4	A	
	B	
A1J42-2	C	
A2J4-2	D	
A2J6-2	E	
A2J8-2	F	
A2J13-2	G	
	H	
A2J15-2	J	
A2J17-2	K	
A2J2-2	L	
A2J9-2	M	
	N	
	P	
	R	
	S	
	T	

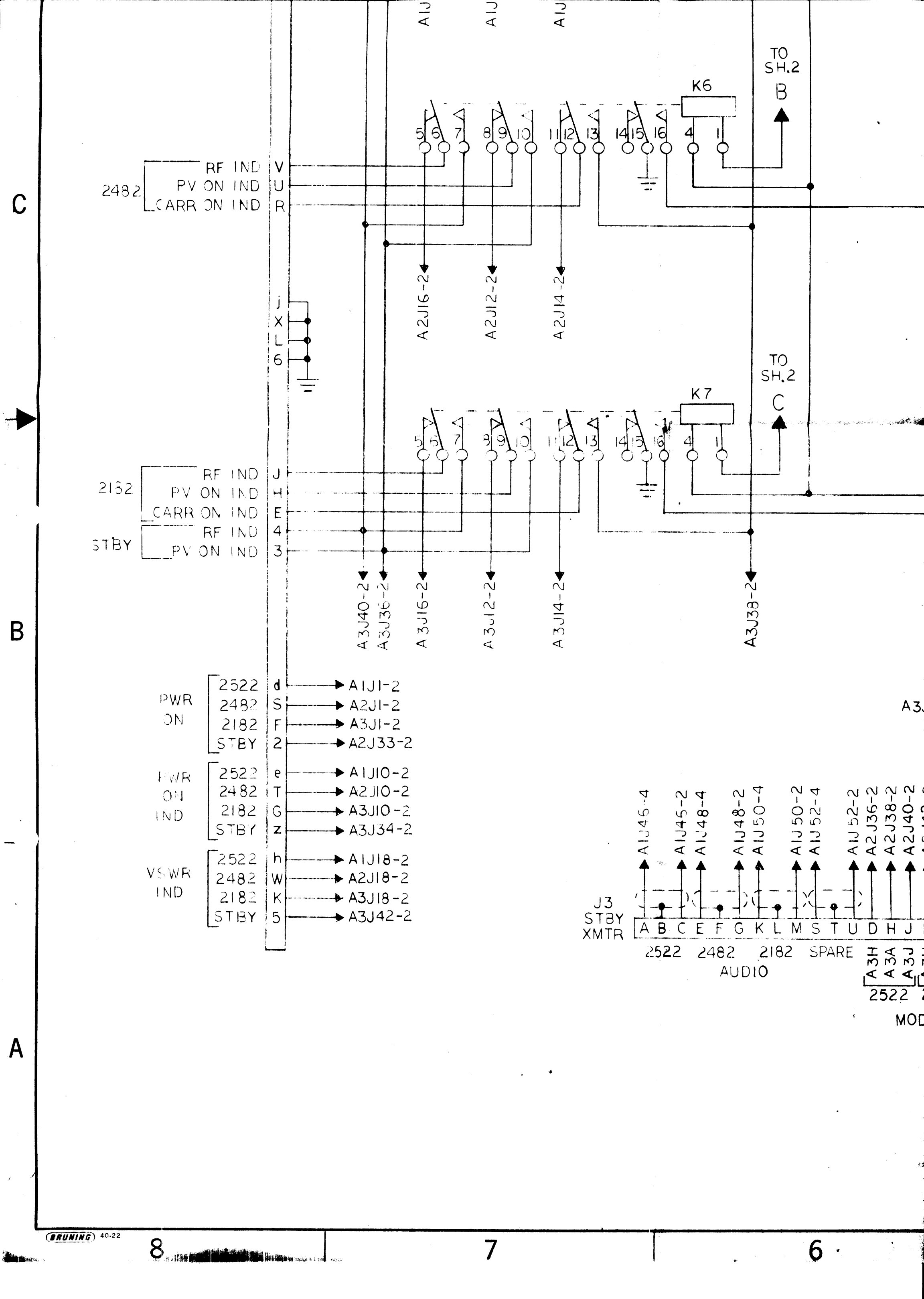
J6
2182
XMTR

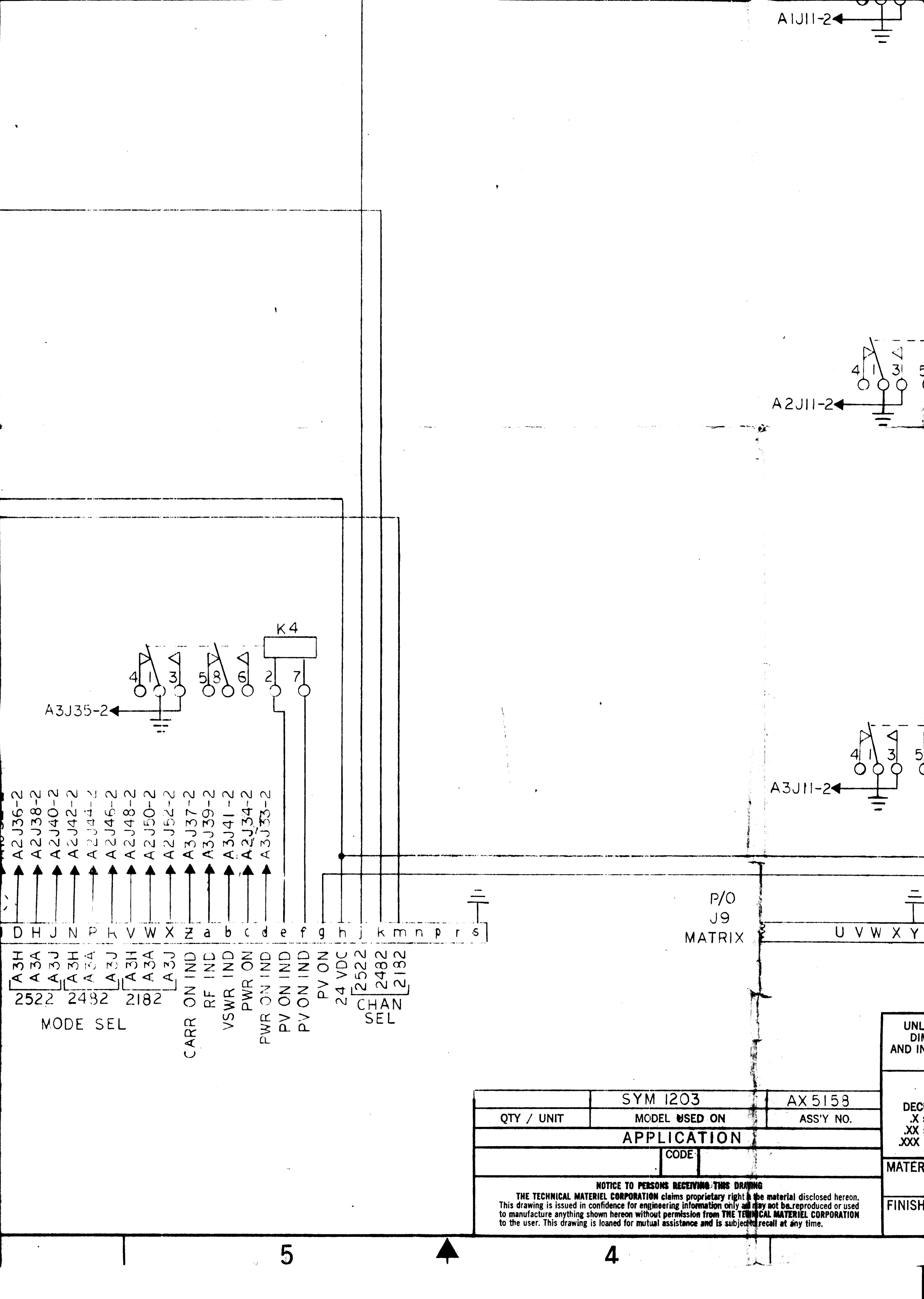
A1J44-4	A	
	B	
A1J44-2	C	
A3J4-2	D	
A3J6-2	E	
A3J8-2	F	
A3J13-2	G	
	H	
A3J15-2	J	
A3J17-2	K	
A3J2-2	L	
A3J9-2	M	
	N	
	P	
	R	
	S	
	T	

K1 K2 K3

D C B

CK1923


C
B
A
A1J
A1J
A1J
TO SH.2
B
K6
5 6 7 8 9 10 11 12 13 14 15 16 4 1
2482
RF IND V
PV ON IND U
CARR ON IND R
A2J16-2
A2J12-2
A2J14-2
j
X
L
6
TO SH.2
C
K7
2162
RF IND J
PV ON IND H
CARR ON IND E
STBY
RF IND 4
PV ON IND 3
A3J40-2
A3J36-2
A3J16-2
A3J12-2
A3J14-2
A3J38-2
PWR ON
2522 d → A1J1-2
2482 S → A2J1-2
2182 F → A3J1-2
STBY 2 → A2J33-2
PWR ON IND
2522 e → A1J10-2
2482 T → A2J10-2
2182 G → A3J10-2
STBY z → A3J34-2
VSWR IND
2522 h → A1J18-2
2482 W → A2J18-2
2182 K → A3J18-2
STBY 5 → A3J42-2
A1J45-4
A1J46-2
A1J48-4
A1J48-2
A1J50-4
A1J50-2
A1J52-4
A1J52-2
A2J36-2
A2J38-2
A2J40-2
J3
STBY XMTR
A B C E F G K L M S T U D H J
2522 2482 2182 SPARE
AUDIO
A3H
A3A
A3J
2522
MOD
BRUNING 40-22
8
7
6



	SYM 1203	AX 5158
QTY / UNIT	MODEL USED ON	ASS'Y NO.
APPLICATION		
	CODE	

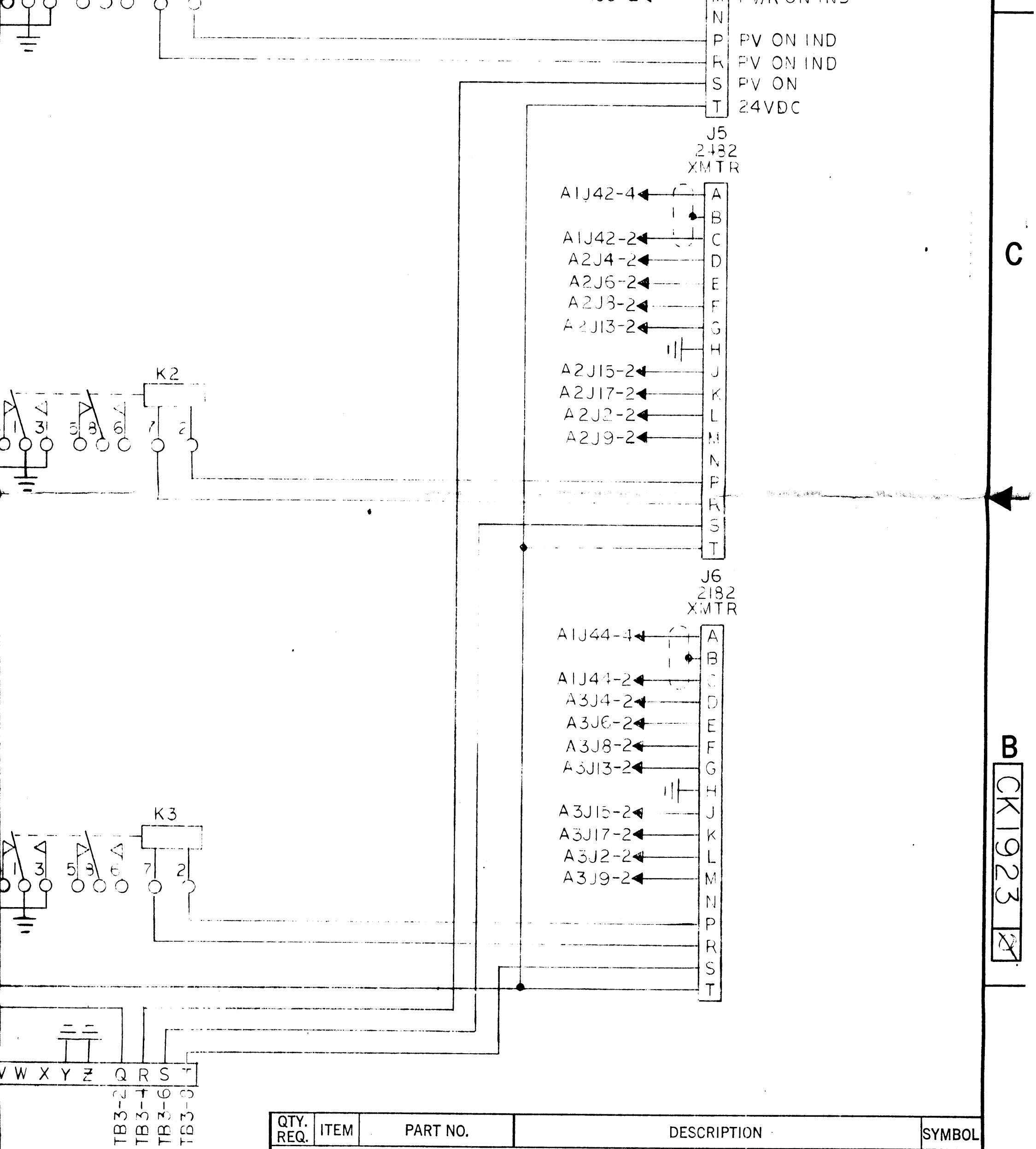
UNL
DIM
AND IN

DEC
.X
.XX
.XXX

MATER

FINISH

5 4



QTY. REQ.	ITEM	PART NO.	DESCRIPTION	SYMBOL

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES

TOLERANCES ON

DECIMALS	FRACTIONS
.X ± .05	± 1/64
.XX ± .01	ANGLES
.XXX ± .005	± 0° -30'

MATERIAL

FINISH

FINAL APPROVAL		DATE 30 Nov 71
MECH. DES.		DATE
ELECT. DES.		DATE 30 Nov 71
CHECKED		DATE
DRAWN		DATE 23 Nov 71

THE TECHNICAL MATERIEL CORP.
MAMARONECK, NEW YORK

DIAGRAM, SCHEMATIC

SYSTEM CONTROL UNIT Figure 2-6.

SIZE	CODE IDENT NO.	DWG NO.	ISSUE
D	82679	CK1923	/

SCALE | SHEET 3 OF 3

CK1923 /

3 2 1

2-16

SECTION 3

OPERATOR'S SECTION

3-1. GENERAL

The Radio Transmitting System, SYM-1203 is capable of supplying up to 500 watts PEP from each GPT-500 transmitter within the SYM-1203 system for transmission on three separate unbalanced antennas. The RF output may also be safely set to any power level below 500 watts PEP. The system RF output is controlled by the AF GAIN control on each exciter. The system is designed for remote controlled operation of each individual transmitter within the system after each transmitter has been initially tuned-up.

3-2. CONTROLS AND INDICATORS

All controls and indicators for the system are located on the front panels of the modular unit except the HAND SET/LINE switch which is on the rear of each STE-5A and the SSB/CW switch located on the rear of each RFE exciter. For a detailed description of these controls and their functions refer to the units technical manual.

NOTE

The tuning controls on the front panel of each RFE-1 and STE-5A have the relative tune position marked on the front panel to aid in initial tuning of the transmitter.

3-3. OPERATING PROCEDURES

A. General

Detailed operating procedures for individual units may be found in the unit technical manuals. Before attempting to operate the system, the operator should become familiar with the controls and indicators of the individual units and the units capabilities.

To give the operator the sequence of system operation, a general operating procedure for channel 1 (2522 kHz) is given in paragraph B for each rack within the system.

B. Starting Procedure

This procedure assumes that installation is complete, 115 vac is applied to each rack and control cable connections have been properly made.

TABLE 3-1. CHECK-OUT PROCEDURE FOR CHANNEL 1 (2522 kHz)

Step	Operation	Normal Indications
1	Set TPM-1K POWER switch to ON position.	POWER lamp on TPM-1K will light (Top unit).
2	Turn AF GAIN control on STE-5A exciter clockwise slightly to actuate ON/OFF switch and set LINE/HANDSET switch to LINE.	POWER indicator on STE-5A (2522 kHz) will light.
3	Set MODE switch on STE-5A (2522 kHz) to AME position.	No indications.
4	Set USB/LSB switch to USB position. Set PTT/VOX switch to PTT.	No indications.
5	Turn ANTI-VOX control maximum clockwise.	No indications.
6	Turn VOX-GAIN control maximum counter clockwise.	No indications.
7	H.V. LINE breaker to ON.	No indications.
8	TRANSMITTER PLATES switch to STANDBY/REMOTE.	No indications.
9	Turn PA TUNING control to panel mark (black dot).	No indications.
10	Turn PA LOADING control to panel mark (black dot).	No indications.
11	Set MAIN LINE circuit breaker to ON.	No indications.
12	Set DRIVER BAND switch to 2-4 position.	No indications.
13	Set PA BAND switch to 2-2.5 position.	No indications.
14	Set SSB/CW switch to SSB (SSB/CW switch located on rear of RFE - 2522).	No indications.
15	Provide a ground closure (PWR ON 2522 kHz) or insert shorting plug (supplied) into 2522 PWR ON circuit jack J2.	MAIN LINE indicator on PSP-500 will light.

TABLE 3-1. CHECK-OUT PROCEDURE FOR CHANNEL 1 (2522 kHz) (continued)

Step	Operation	Normal Indications
	NOTE Set POWER switch on AX5158 front panel to ON position (power switch located directly above patch panel in rack B). Observe that all Matrix switch knobs are in the vertical position and the LOCAL MATRIX indicator is not lit.	
16	Select A3J mode of emission by remote or insert shorting plug into 2522 J8 jack on patch panel.	H.V. LINE indicator will light. TRANSMITTER PLATES indicator will light. PA PLATE meter will indicate approximately 220 ma quiescent current.
17	Obtain a two tone audio signal from the 2522 audio line (-16 dbm) or insert two audio tones in 2522 Audio jack (J40) on patch panel.	No indications.
18	Rotate AF GAIN CONTROL clockwise slightly.	PA PLATE current meter indication will increase from quiescent value.
19	Adjust DRIVER TUNING for a peak on the MULTIMETER.	
	NOTE Keep peaks below 20 when tuning the DRIVER by decreasing (ccw) the AF GAIN.	
20	Turn AF GAIN control slowly until the PA PLATE meter indicates approximately 300 ma.	
21	Adjust PA TUNING control for a resonant dip on the PA PLATE meter.	
22	Adjust the PA LOADING and TUNING controls for a dip in PA PLATE current indication and until the PA LOADING control causes no further increase in PA PLATE meter indication.	
23	Rotate the AF GAIN control clockwise until the TPM-1K FORWARD POWER meter indicates 400 watts PEP.	

TABLE 3-1. CHECK-OUT PROCEDURE FOR CHANNEL 1 (2522 kHz) (continued)

Step	Operation	Normal Indications
24	Rotate AF GAIN control counter clockwise to decrease the FORWARD POWER to ZERO, and remove remote closure or shorting plug from 2522 A3J jack (J8) on patch panel.	Transmitter will be unkeyed and H.V. LINE lamp will go out. PA PLATE meter indicates zero.
25	Select A3H mode by remote or insert shorting plug in 2522 A3H jack (J4) on patch panel.	(1) H.V. LINE and TRANSMITTER PLATES lamp will light. (2) PA PLATE meter will indicate 220 ma. (3) FORWARD POWER meter on TPM-1K (Top Unit) should indicate 100 watts (AME carrier)
26	Obtain single tone audio signal (-16 dbm) from 2522 audio line, or insert single tone audio (-16 dbm) in 2522 audio jack (J40) on patch panel.	
27	Rotate AF GAIN control clockwise to increase FORWARD POWER output to 400 watts as indicated on the TPM-1K FORWARD power meter.	(1) TPM-1K FORWARD power meter indicates 400 watts. (2) AF GAIN control knob indicator line should be in vertical position.
28	Remove -16 dbm audio tone applied in step 26 (DO NOT READJUST AF GAIN CONTROL).	FORWARD POWER meter should indicate 100 watts.

NOTE

The foregoing procedure sets the transmitter output levels for A3H, A3A and A3J operation. Therefore the AF GAIN control should not be re-adjusted once step 27 is completed.

29	Remove shorting plug from 2522 A3H jack (J4) or remove remote closure for A3H.	Transmitter output will decrease to zero. H.V. LINE and TRANSMITTER PLATES indicators will go out.

This completes the initial check-out procedures for channel 1 transmitter (2522 kHz). Channels 2 and 3 (2482 kHz and 2182 kHz respectively) transmitters must be initially tuned-up in the same manner. The modular units for each transmitter set have the same serial number on each unit nameplate to insure the correct transmitter and channel frequency is used during operation. The serial number and corresponding channels are as follows:

Channel 1 (2522 kHz)	Serial No. 40942A
Channel 2 (2482 kHz)	Serial No. 40942B
Channel 3 (2182 kHz)	Serial No. 40942C
Standby Channel 1	Serial No. 40943A
Standby Channel 2	Serial No. 40943B
Standby Channel 3	Serial No. 40943C
Spare Channel	Serial No. 40943D

TABLE 3-2. STANDBY TRANSMITTER CHECKOUT (2522 kHz)

RACK C

Step	Operation	Normal Indications
1	Set TPM-1K POWER switch to ON position (TPM-1K for standby transmitter located directly above REF-2-4 in rack).	POWER indicator on TPM-1K will light.
2	Set switches on PSP-500 (serial number 40943) as follows: MAIN LINE breaker - ON TRANSMITTER PLATES - STANDBY/REMOTE HV LINE - ON	
3	Set controls on standby exciters (serial number 40943A, 40943B and 40943C, channels 1, 2 and 3 respectively as follows: a. AF GAIN control - clockwise slightly to light POWER INDICATOR. b. MODE switch - AME position. c. PTT/VOX switch - PTT position. d. ANTI-VOX control - max clockwise. e. VOX GAIN control - max counterclockwise f. USB/LSB switch - USB g. HANDSET/LINE switch LINE position (HANDSET/LINE switch located in rear of STE-5A exciter).	

TABLE 3-2. STANDBY TRANSMITTER CHECKOUT (2522 kHz) (continued)

Step	Operation	Normal Indications
4	Set controls on RFE-2-4 (serial number 40943) as follows: CHANNEL switch - REMOTE position SSB/CW switch - SSB position (SSB/CW switch located on rear of RFE-2-4) MULTIMETER switch - FIL position	
5	Select standby transmitter by remote or insert shorting plug in STBY PWR jack (J34) on patch panel.	MAIN LINE indicator on PSP-500 (serial number 40943) will light. MULTIMETER needle on RFE-2-4 will indicate at FIL mark.
6	Select standby transmitter Channel 1 by remote closure or insert shorting plug in STBY CHAN SEL 2522 jack (J22) on patch panel.	(1) CHANNEL knob on REF-2-4 (serial number 40943) will automatically rotate to position 1 indicating channel 1. (2) Antenna Matrix switch will rotate to place STBY CHANNEL 1 transmitter on ANT 1.
7	Select A3H mode by remote or insert shorting plug into 2522 A3H jack (J36) on patch panel.	(1) H.V. LINE indicator will light. (2) TRANSMITTER PLATES indicator will light. (3) TPM-1K FORWARD POWER meter will indicate 100 watts (AME CARRIER power).

NOTE

Insure that AF GAIN control on STE-5A exciters are counter clockwise only to point that turns on STE-5A exciters.

8	Obtain a single tone audio signal (-16 dbm) from 2522 audio line or insert single tone audio in 2522 STBY AUDIO jack (J46) on patch panel.	
9	Rotate AF GAIN control on channel 1 exciter (serial 40943A) clockwise until FORWARD POWER meter indicates 400 watts.	TPM-1K FORWARD POWER meter indicates 400 watts.
10	Remove standby audio applied in step 8. DO NOT READJUST AF GAIN CONTROL.	TPM-1K FORWARD POWER meter indication decreases to 100 watts.

TABLE 3-2. STANDBY TRANSMITTER CHECKOUT (2522 kHz) (continued)

Step	Operation	Normal Indications
11	Remove remote closure or shorting plug for STBY 2522 A3H (J36) on patch panel.	(1) H.V. LINE and TRANSMITTER PLATES indicators go out. (2) PA PLATE meter indicates zero plate current. (3) TPM-1K FORWARD POWER meter indicates zero.
12	Select standby 2522 A3A mode by remote or insert shorting plug in standby 2522 A3A jack (J38) on patch panel.	(1) H.V. LINE and TRANSMITTER PLATES indicator lights. (2) PA PLATE meter indicates plate current.
13	Obtain a two tone audio signal (-16 dbm) from 2522 audio line or insert two tone audio signal in STBY 2522 AUDIO jack (J46). DO NOT READJUST AF GAIN control.	TPM-1K FORWARD POWER meter indications increases to 400 watts.
14	Remove remote closure or shorting plug for STBY 2522 A3A.	(1) H.V. LINE and TRANSMITTER PLATES indicator will go out. (2) PA PLATE meter indicates zero plate current.
15	Select standby A3J mode by remote or insert shorting plug in standby 2522 A3J jack (J40) on patch panel.	(1) FORWARD POWER meter on TPM-1K will indicate 400 watts. (2) H.V. LINE and TRANSMITTER PLATES indicators will light. (3) PA PLATE meter will indicate plate current.

The foregoing checkout procedure is for the referenced standby channel 1 transmitter (2522 kHz) only. However, standby transmitters for channels 2 and 3 must be initially tuned in the same manner, differing only in the appropriate (1) exciter selection: STE-5A serial number 40943B is for channel 2 and STE-5A serial number 40943C is for channel 3; (2) remote closures or patching for STBY mode, STBY audio and STBY channel selection.

Example:

STBY Channel 2 (2482)

Mode	Operation
Standby Channel Select	Provide remote closure for standby channel 2 (2482) select or insert shorting plug in STBY CHAN SEL 2482 jack (J24) on patch panel.
A3H	Provide remote closure for STBY A3H or insert shorting plug in STBY A3H jack (J42) on patch panel.
A3A	Provide remote closure for STBY A3A or insert shorting plug in STBY A3A jack (J44) on patch panel.

STBY Channel 2 (2482) (continued)

Mode	Operation
A3J	Provide remote closure for STBY A3J or insert shorting pin in A3J jack (J46) on patch panel.
STBY AUDIO (2482)	Obtain -16 dbm audio tone from 2482 audio line (single tone for A3H, two tones for A3A or A3J) or insert -16 dbm in STBY AUDIO 2482 jack (J48) on patch panel

STBY Channel 3 (2182)

Mode	Operation
A3H	Provide remote closure for STBY A3H or insert shorting plug in STBY 2182 A3H jack (J48) on patch panel.
A3A	Provide remote closure for STBY A3A or insert shorting plug in STBY 2182 A3A jack (J50) on patch panel.
A3J	Provide remote closure for STBY A3J or insert shorting plug in STBY 2182 A3J jack (J52) on patch panel.
Standby Audio	Obtain -16 dbm audio tone from 2182 audio line (single tone for A3H, two tones for A3A and A3J) or insert -16 dbm in STBY AUDIO 2182 jack (J50) on patch panel.

3-4. READBACK STATUS INDICATORS

a. Introduction

Provisions for system operational status are provided for connection to master control panel. Additionally each indicator connection is routed through the patch panel for testing purposes. The Readback Indicator Chart, Table 3-3, illustrates the indicator and corresponding transmitter status.

TABLE 3-3. READBACK INDICATOR CHART

Indicator	Transmitter Status
PWR	Indicates primary power applied to transmitter selected (CH-1, CH-2 or CH-3).
PV	Indicates plate voltage applied to transmitter selected.
CARR	Indicates exciter carrier ON when A3H, A3A or A3J mode is selected.

TABLE 3-3. READBACK INDICATOR CHART (continued)

Indicator	Transmitter Status
RF	Indicates no transmitter forward power.
SWR	Indicates SWR overload tripped and transmitter is off the air.

TABLE 3-4. STANDBY INDICATIONS

Indicator	Standby Transmitter Status
PWR	Indicates primary power applied to standby transmitter.
PV	Indicates plate voltage is applied to standby transmitter.
STBY CHAN IND	Indicates standby channel selected.
CARR	Indicates exciter carrier on.
RF	Indicates no standby forward power.
SWR	Indicates VSWR high and SWR overload tripped.
A3H	Indicates A3H standby mode.
A3A	Indicates A3A standby mode.
A3J	Indicates A3J standby mode.

SECTION 4

SCHEMATIC DIAGRAMS

This section contains schematic diagrams for the system monitor and control units. Diagrams for modular units (STE-5A Exciter, GPT-500 Transmitter, and SLS-4M Antenna Switching Matrix) may be found in the technical manuals for these units. Table 4-1 lists the figures within this system manual and the corresponding TMC schematic drawing numbers.

TABLE 4-1. LIST OF DIAGRAMS

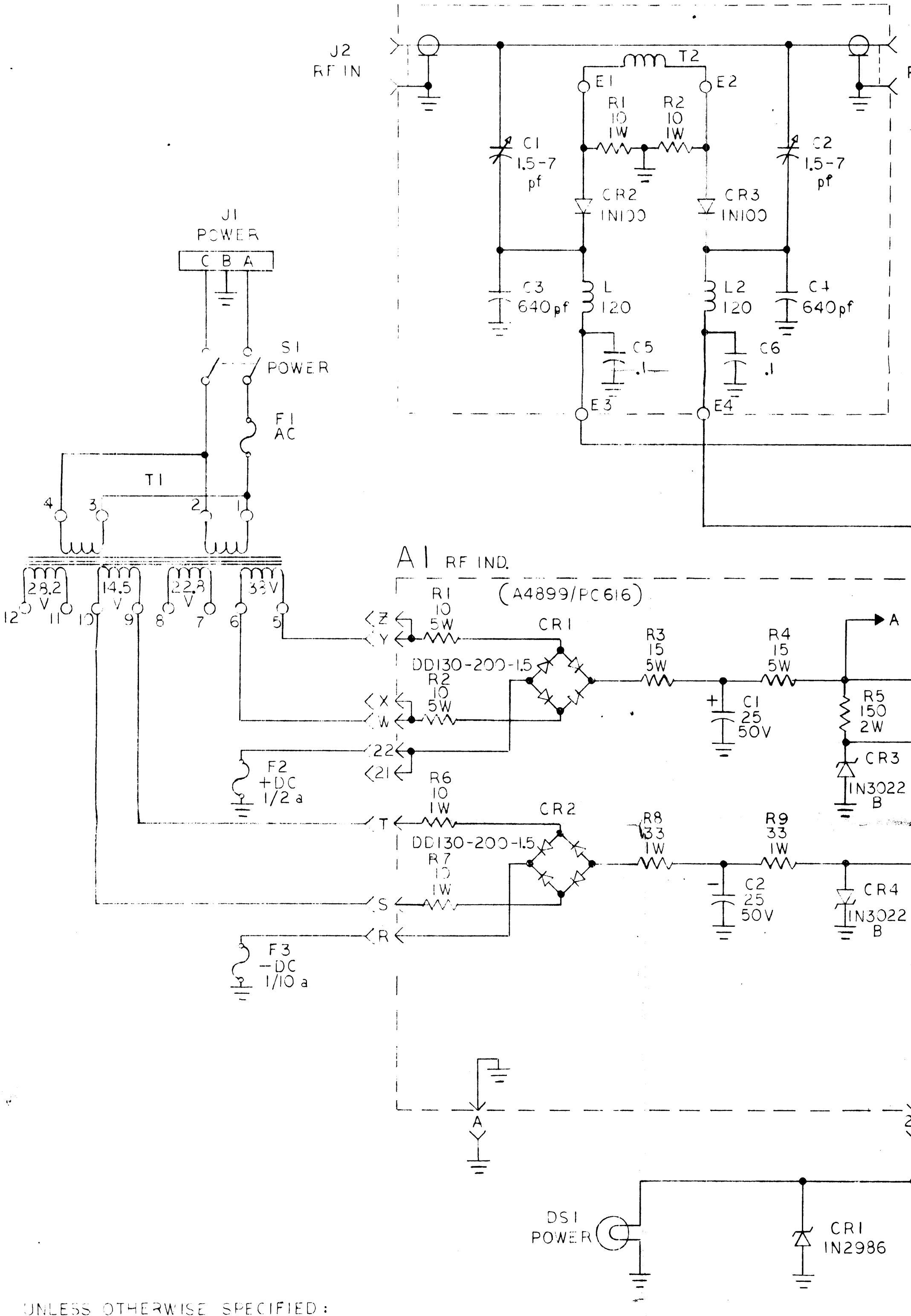
Figure No.	Title	TMC Dwg. No.
4-1	Transmitter Power Monitor TPM-1K, Schematic Diagram	CK1912
4-2	Transmitter Control Unit AX5159, Schematic Diagram	CK1916
4-3	Line Control Unit AX5138, Schematic Diagram	CK1911

8 7 6

D

C

B



UNLESS OTHERWISE SPECIFIED:

5 4

A2 PEAK READING AMP
(A4900/PC 617)

J3
RF OUT

FEEDBACK
R4
500K

R3
10K

C3
.001

R1
680K

C1
3
50V

R2
47K

Z1
NW156

C4
.001

R6
12K

C2
.001

R7
5K

R5
1.5K

R8
27K

M1
FWD PWR

C7
350
75V

R23
10K

CR5
IN100

R12
10K

FWD
CAL
R11
10K

C3
.1

C4
.1

RF IND
LEVEL
R13
10K

C5
.1

R14
5K

C6
510pf

C7
20pf

Z1
NW156

R5
150
2W

CR3
IN3022
B

FEEDBACK
R17
500K

R16
1K

R18
1K

CR4
IN3022
B

R10
1.2K

Q1
2N3646

R15
100

K1
RF IND

K2
SWR IND

CR1
IN2986

REVISIONS							
E.M.N.NO	DRAFT	CHKD	ZONE	LTR	DESCRIPTION	DATE	APPROVED
	U			Ø		11/9/71	

C4
.001

3

M2
REFL PWR
1
5
3
4

P
N
16

REFL CAL
R19
10K

A
R21
2.2K
R22
100

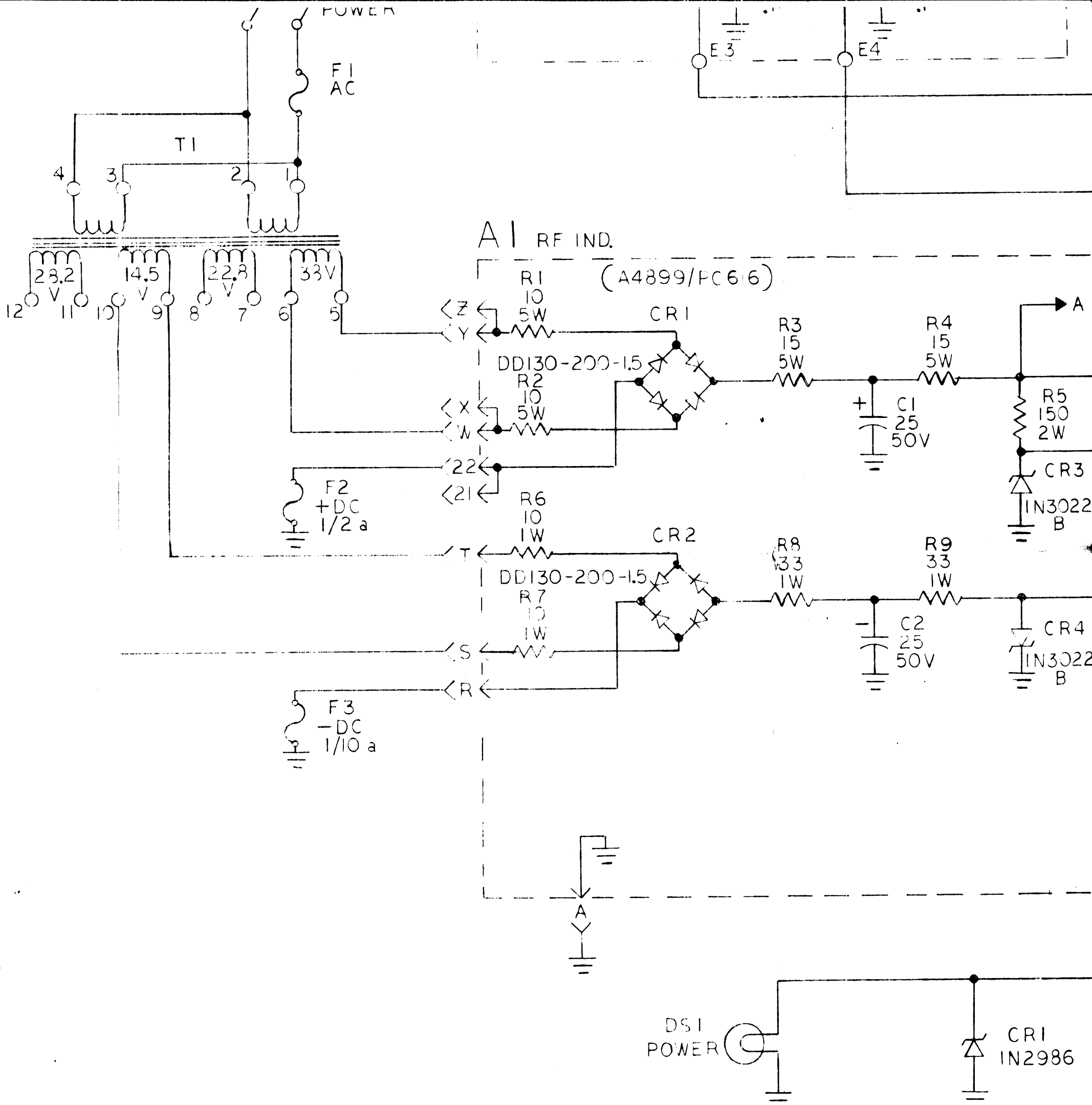
Q2
2N1595
3
2
1

R20
1K

DS2
SWR OVLD
7

S2
RESET
B
C

D
C
B
CK1912 e



UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTANCES IN OHMS, 1/2W.
2. ALL CAPACITANCES IN MICRO-FARADS.
3. ALL INDUCTANCES IN MICRO-HENRIES.
4. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR COMPLETE DESIGNATION PREFIX THE PART DESIGNATION WITH THE SUB-ASSEMBLY DESIGNATION.

LAST SYMBOLS			
UNIT		A1	A2
A2	M2	C7	C4
C7	R2	CR5	E5
CR3	S2	K2	R8
DS2	T2	Q2	Z1
E4	TP1	R23	
F3	XDS2	XK2	
J4	XF3	Z1	
L2	XA1		

C B A

8 7 6

FWD PWR

C7
350
75V

15

K

M

R23
10K

CR5
IN100

R12
10K

FWD
CAL
R11
10K

C3
.1

C4
.1

RF IND
LEVEL

R13
10K

C5
.1

R14
5K

C6
510pf

C7
20pf

Z1
NW156

8
3
2
7
5
6
4

4

8

P

REF

R19
10K

A

R5
150
2W

CR3
IN3022
B

CR4
IN3022
B

R10
1.2K

FEEDBACK
R17
500K

R16
1K

R18
1K

Q1
2N3646

R15
100

K1
RF IND

K2
SWR IND

1
4

5 6 7 8 9 10

13 10 12 9 11 L

5 6 7 8 9 10 11 12 13 14 15 16

5 J 4 F 2 3 6 H B D E C

20

DS
SWR O

S2
RESE
B

CR1
N2986

TB1

1 2 3 4 5 6 7 8 9 10

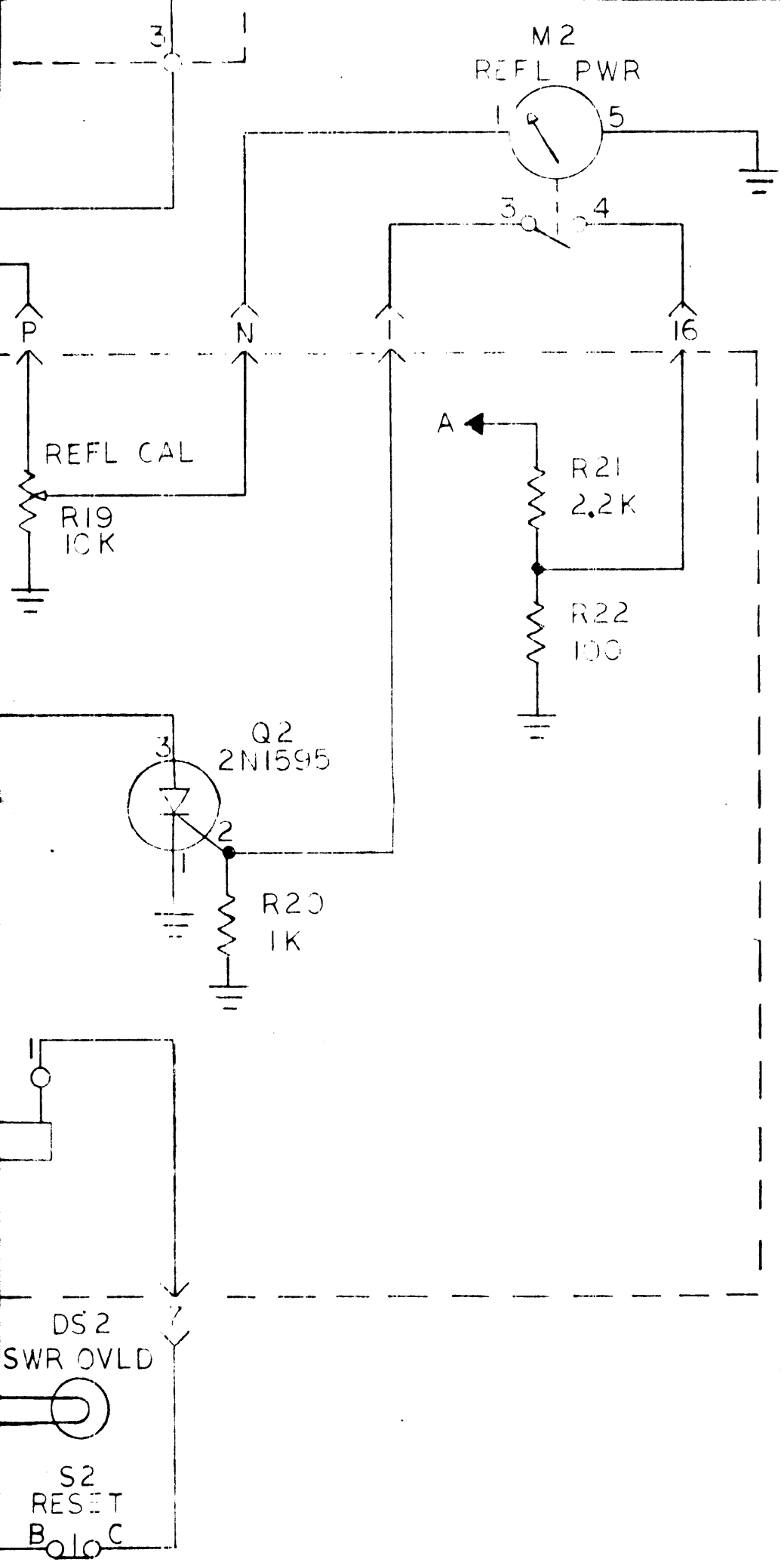
GND NC C NO RF +24 V DC RESET NC C NO GND SWR

J4
CONTROL

A B C D E F G

	TPM-1K	
QTY / UNIT	MODEL USED ON	ASS'Y NO.
APPLICATION		
	CODE	

5 4



QTY. REQ.	ITEM	PART NO.	DESCRIPTION	SYMBOL

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES

TOLERANCES ON

DECIMALS	FRACTIONS
.X ± .05	± 1/64
.XX ± .01	ANGLES
.XXX ± .005	± 0° -30'

MATERIAL

FINISH

FINAL APPROVAL		DATE 23 Nov 71
MECH. DES.		DATE
ELECT. DES.		DATE 23 Nov 71
CHECKED		DATE
DRAWN		DATE 1 Nov 71

THE TECHNICAL MATERIEL CORP.
MAMARONECK, NEW YORK

DIAGRAM SCHEMATIC

TRANSMITTER POWER MONITOR

Figure 4-1

SIZE	CODE IDENT NO.	DWG NO.	ISSUE
D	82679	CK1912	Ø

SCALE

SHEET OF

CK1912 Ø

3 2 1

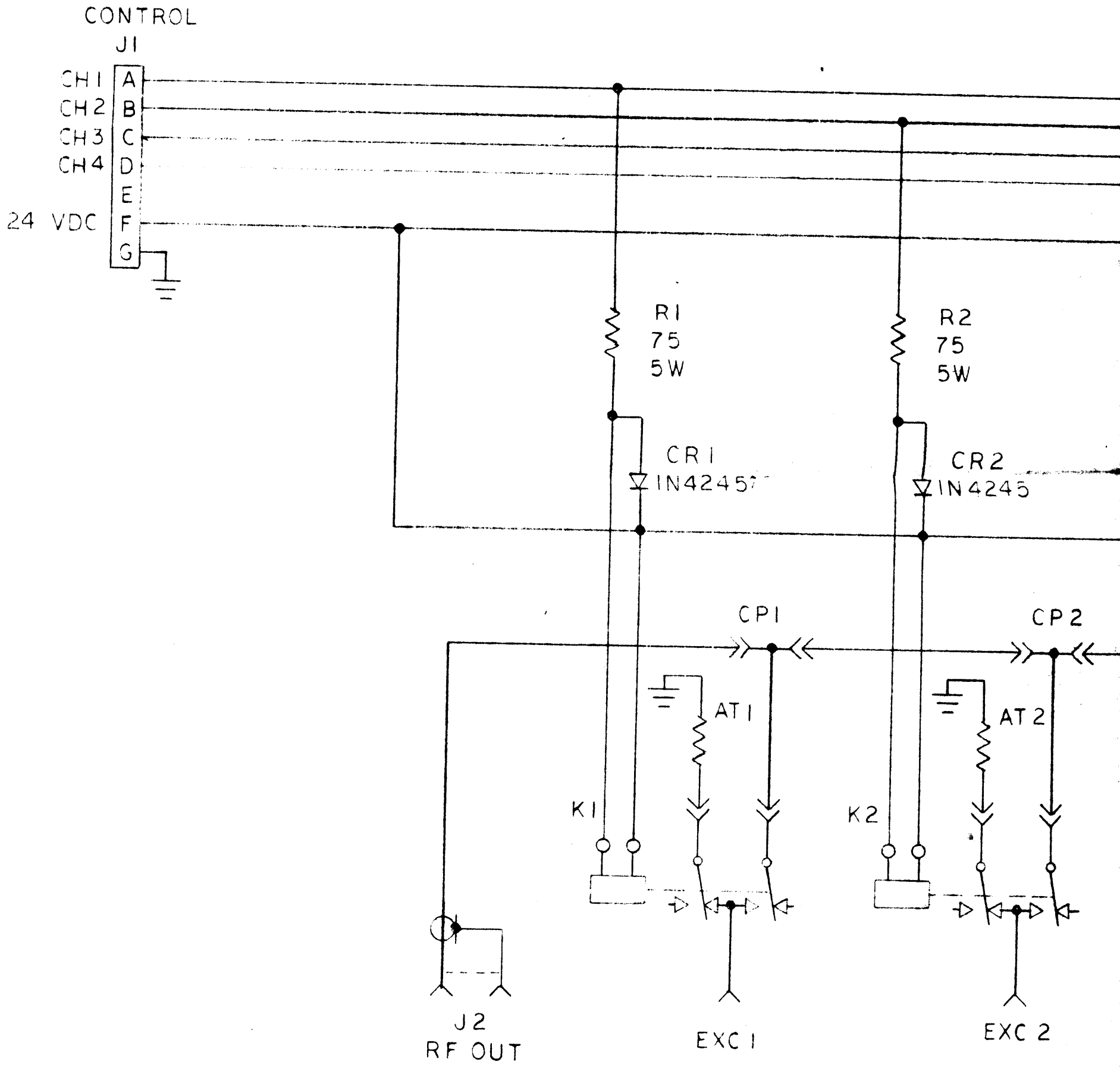
4-2.

D

C

B

A



	SYM 1203	AX 5159
QTY / UNIT	MODEL USED ON	ASS'Y NO.

APPLICATION

	CODE	

UNLESS OTHER
DIMENSIONS
AND INCLUDE CH
OR PLATE

TOLERA

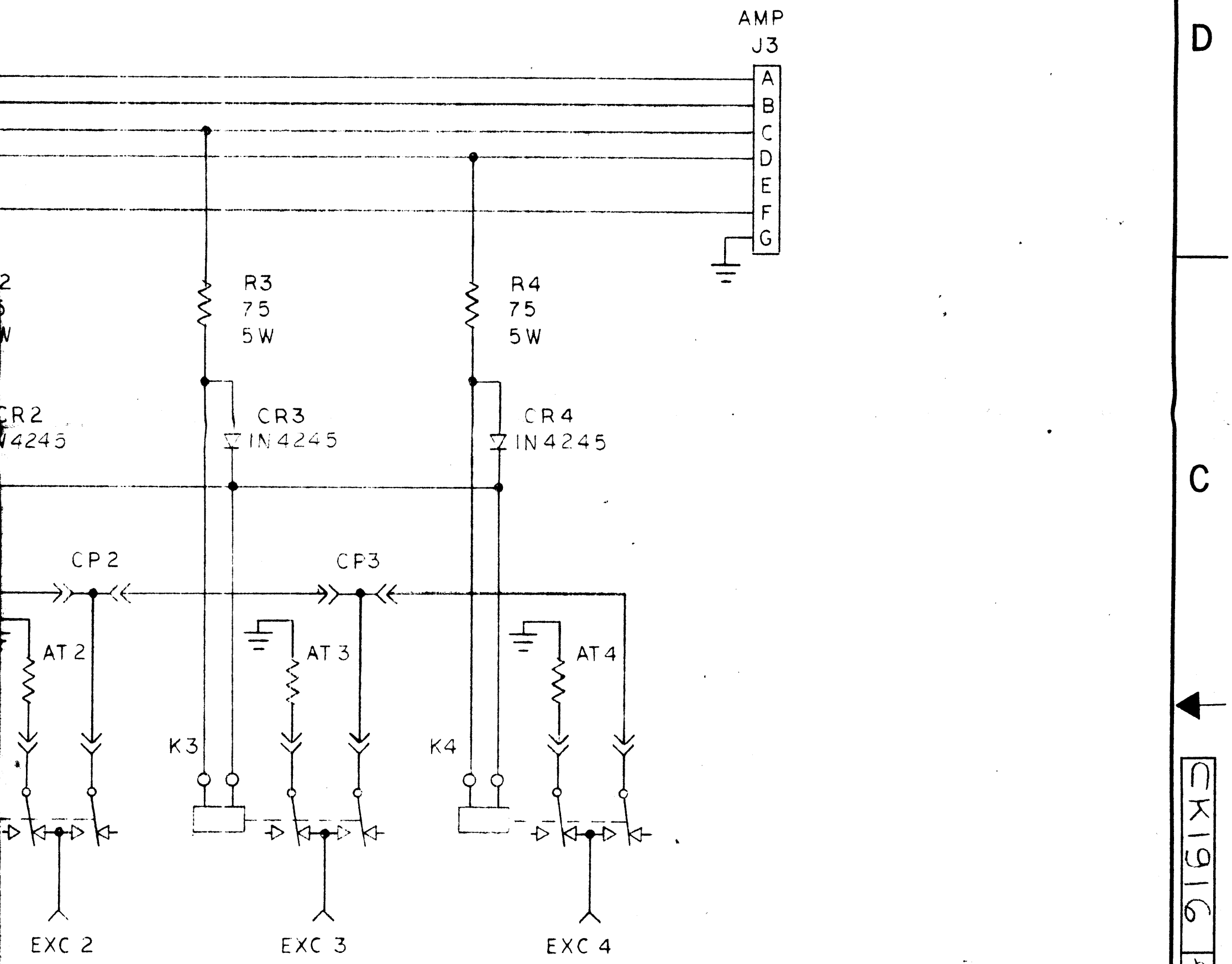
DECIMALS
.X ± .05
.XX ± .01
.XXX ± .005

MATERIAL

FINISH

2 1

REVISIONS							
E.M.N.NO	DRAFT	CHKD	ZONE	LTR	DESCRIPTION	DATE	APPROVED
	CW			Ø	ORIGINAL RELEASE FOR PRODUCTION	12/1/71	



D

C

CK1916 Ø

B

A

QTY. REQ.	ITEM	PART NO.	DESCRIPTION	SYMBOL

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES

TOLERANCES ON

DECIMALS	FRACTIONS
.X ± .05	± 1/64
.XX ± .01	ANGLES
.XXX ± .005	± 0° -30'

MATERIAL

FINISH

FINAL APPROVAL		DATE 30Nov71
MECH. DES.		DATE
ELECT. DES.		DATE 30Nov71
CHECKED		DATE
DRAWN		DATE 29Nov71

THE TECHNICAL MATERIEL CORP.
MAMARONECK, NEW YORK

DIAGRAM, SCHEMATIC

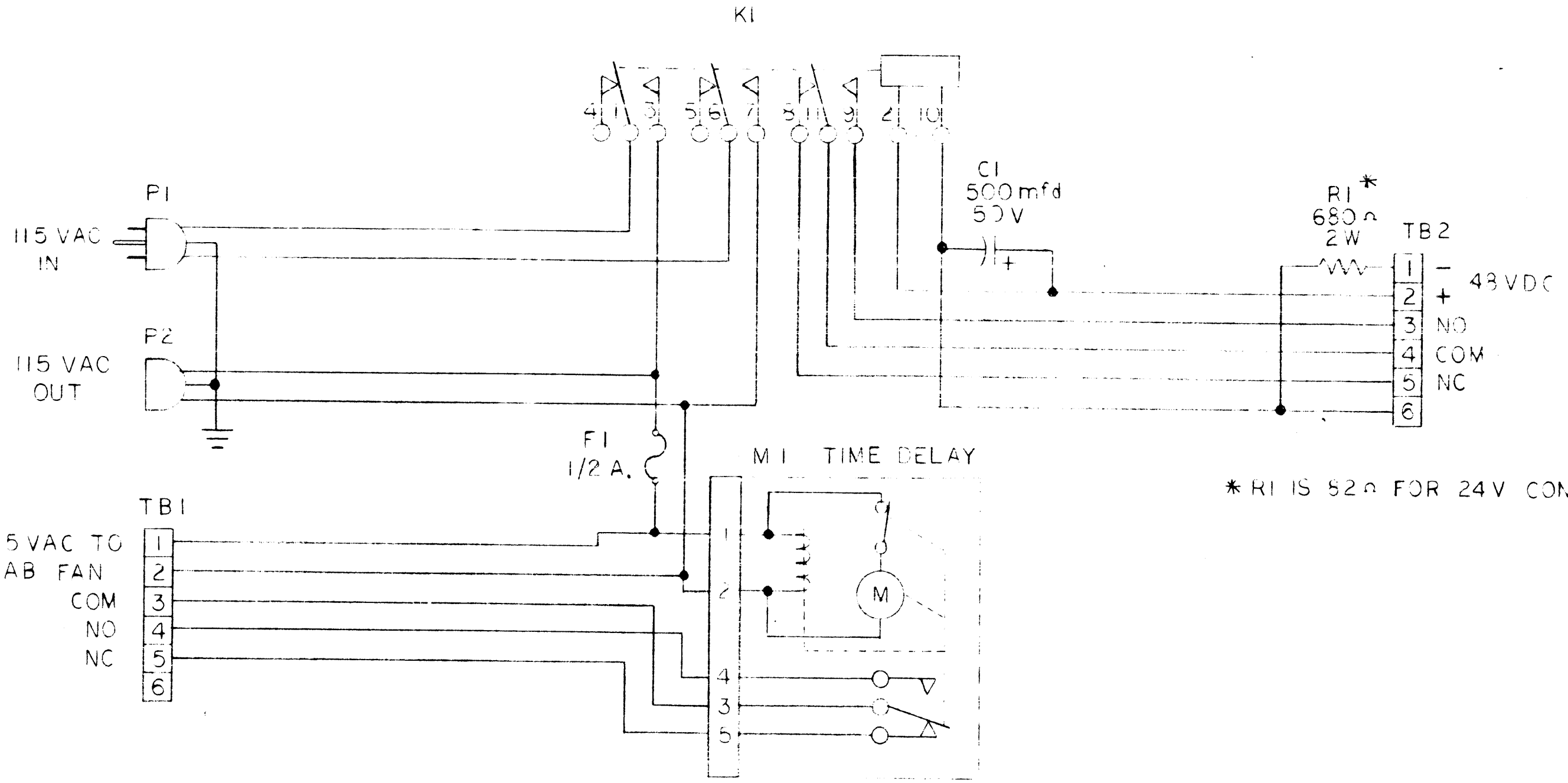
TRANSMITTER CONTROL UNIT
AX 5159 Figure 4-2

SIZE	CODE IDENT NO.	DWG NO.	ISSUE
C	82679	CK1916	Ø

SCALE | SHEET OF 2 3

2 1

REVISIONS							
ZONE	LTR	DESCRIPTION	DATE	E.M.N.NO	DRAFT	CHKD	APPD
	Ø	ORIG RELEASE FOR PROD	9/71		CV		



* R1 IS 82Ω FOR 24V CONTROL

REQ'D	ITEM	PART NUMBER	DESCRIPTION	SYM

LIST OF MATERIAL

	SYM 1203	AX5138
QTY / UNIT	MODEL USED ON	ASS'Y NO.

APPLICATION

CODE

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DECIMALS		FRACTIONS
.X ± .05	TOLS	1/64
.XX ± .01		ANGLES
.XXX ± .005		0° 30'

MATERIAL

FINISH

FINAL APPROVAL		DATE 30 Nov 71
MECH. DES.		DATE
ELECT. DES.		DATE 30 Nov 71
CHECKED		DATE
DRAWN		DATE 29 Nov 71

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MAMARONECK, NEW YORK

DIAGRAM, SCHEM.
LINE CONTROL UNIT Figure 4-3

SIZE	CODE IDENT. NO.	DWG NO.	ISSUE
B	82679	CK1911	Ø

SCALE | SHEET OF

FCI-10-170 (10-66)

SECTION 5

PARTS LIST

5-1. INTRODUCTION

Reference designations have been assigned to identify all Subassembly/ PC Card parts of the equipment. They are used for marking the equipment and are included on drawings, diagrams, and in the parts list. The letters of a reference designation indicate the kind of part (generic group), such as resistor, capacitor, unit, subassembly, PC card, transistor, integrated circuit, etc. The number differentiates between parts of the same generic group. Sockets associated with a particular plug-in device, such as electron tubes or lamps, are identified with a reference designation which includes the reference designation of the plug-in device.

NOTE

Parts list data for the SYM-1203 is divided between the STE-5A, PAL-500, LPF-750-3 and the SLS-4M technical manuals. Refer to the applicable manual for part numbers when ordering replacement parts for the above mentioned modular units.

Parts List for the Transmitter Power Monitor TPM-1K, Line Control AX5138, System Control AX5158, and Transmitter Control AX5159 are listed on the following pages.

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
A1	Assembly, RF Indicator	A-4899
A2	Assembly, Peak Reading	A-4900
C1 thru C6	Not Used	
C7	Capacitor, Fxd, Elect	CE119-350-75
CR1	Scond, Dev, Dio	1N2986
DS1	Lamp, Incand, Bay	BI101-1819
DS2	Same as DS1	
F1	Fuse, Slow-Blow	FU102-.25
F2	Fuse, Slow-Blow	FU102-.5
F3	Fuse, Slow-Blow	FU102-.1
J1	Conn, Recp, ML 3/C	MS3102A16S-5P
J2 & J3	Not Used	
J4	Conn, Recp, FML 7/C	MS3102A16S-1S
M1	Meter, Fwd, Pwr	MR229
M2	Meter, Refl, Pwr	MR230
S1	Switch,Toggle	ST22K
S2	Switch, Push-Button	SW296-1
T1	Transformer, Sd	TF363
TB1	Terminal, Strip, Barr	TM100-10
XDS1	Light, Ind	TS106-2
XDS2	Light, Ind, Red	TS106-1
XF1 thru XF3	Fuse, Holder	FH100-1

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
A1C1	Capacitor, Fxd, Elec	CE105-25-50
A1C2	Same as A1C1	
A1C3	Capacitor, Fxd, Polyester	CX119-104M
A1C4	Same As A1C3	
A1C5	Same As A1C3	
A1C6	Capacitor, Fxd, Mica	CM111E511H5S
A1C7	Capacitor, Fxd, Mica	CM111C200J5S
A1CR1	Scond, Dev, Dio	DD130-200-1.5
A1CR2	Same as A1CR1	
A1CR3	Scond, Dev, Dio	1N3022B
A1CR4	Same As A1CR3	
A1CR5	Scond, Dev, Dio	1N100
A1K1	Rel, Arm, DPDT	RL156-1
A1K2	Rel, Ar, 4 PDT	RL156-8
A1Q1	Transistor	2N3646
A1Q2	Transistor	2N1595
A1R1	Resistor, Fxd, Comp 5W	RR114-10W
A1R2	Same As A1R1	
A1R3	Resistor, Fxd, Comp 5W	RR114-15W
A1R4	Same As A1R3	
A1R5	Resistor, Fxd, Comp	RC42CF151J
A1R6	Resistor, Fxd, Comp	RC32CF100J
A1R7	Same As A1R6	
A1R8	Resistor, Fxd, Comp	RC32CF330J
A1R9	Same as A1R8	

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
A1R10	Resistor, Fxd, Comp	RC20GF122J
A1R11	Resistor, Var, Comp	RV111U103A
A1R12	Resistor, Fxd, Comp	RC20GF103J
A1R13	Same as R11	
A1R14	Resistor, Fxd, Comp	RC20GF502J
A1R15	Resistor, Fxd, Comp	RC20GF101J
A1R16	Resistor, Fxd, Comp	RC20GF102J
A1R17	Resistor, Var, Comp	RV111U504A
A1R18	Same as R16	
A1R19	Same as R11	
A1R20	Same as R16	
A1R21	Resistor, Fxd, Comp	RC20GF222J
A1R22	Same as R15	
A1R23	Same as R12	
A1XK1	Socket, Relay	TS171-5
A1XK2	Socket, Relay	TS171-4
A1Z1	Network, Op Amp	NW156

A-4900 Peak Reading Assembly

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
A2C1	Capacitor, Fixed,	CN114-3R05J
A2C2	Capacitor, Fixed, Cer	CC100-29
A2C3	Same as A2C2	
A2C4	Same as A2C2	
A2E1 thru A2E5	Term, Stud	TE127-2
A2R1	Resistor, Fixed, Comp	RC20GF684J
A2R2	Resistor, Fixed, Comp	RC20GF473J
A2R3	Resistor, Fixed, Comp	RC20GF103J
A2R4	Resistor, Var, Comp	RV111U504A
A2R5	Resistor, Fixed, Comp	RC20GF152J
A2R6	Resistor, Fixed, Comp	RC20GF123J
A2R7	Resistor, Var, Comp	RV111U502A
A2R8	Resistor, Fixed, Comp	RC20GF273J
A2Z1	Network, Op Amp	NW156

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C1	Capacitor, Var	CV11A070
C2	Same as C1	
C3	Capacitor, Fxd, Mica	CM200F640F
C4	Same as C3	
C5	Capacitor, Fxd, Polyester	CX119-104M
C6	Same as C5	
CR1	Not Used	
CR2	Scond, Dev, Dio	1N100
CR3	Same as CR2	
E1	Ins, Feed-thru	TE193-B4S9
E2	Same as E1	
E3	Term, Turret	TE102-2
E4	Same as E3	
J1	Not Used	
J2	Conn, Recp, HN	UG496/U
J3	Same as J2	
L1	Coil, Rf	CL240-120
L2	Same as L1	
R1	Resistor, Fxd, Comp	RC32GF100J
R2	Same as R1	
T2	Coil, Rf, Toroid	CL473

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
AT1 thru AT4	Load, Dummy, Elec	DL100-2
CP1	Adaptor, BNC, T	UG274/U
CP2	Same as CP1	
CP3	Same as CP1	
CR1 thru CR4	Scond, Dev, Dio	1N4245
K1 thru K4	Rel, Arm, Coax	RL157-2
R1	Resistor, Fixed, WW 5W	RW107-17

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C1	Capacitor, Fixed, Elec	CE116-10VN
F1	Fuse, Slow-Blow	FU102-.5
K1	Rel, Arm 3PDT	RL168-3C10-24vdc
M1	Timer	TI105-3
P1	Connector, PL, ML, AC	PL218
P2	Connector, PL,FML, AC	PL176
R1	Resistor, Fixed, Comp	RC42GF681J
TB1	Term, Bd, Barr	TM102-6
TB2	Same as TB1	
XF1	Fuse Holder	FH100-1
XK1	Socket, Relay	TS100-6

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
A1 thru A3	Strip, Jack	JJ304
A4	Assembly, Term, Bd	A-4910
DS1	Lamp, Min	BI101-1819
DS2	Same as DS1	
F1	Fuse, Ctg	FU102-2
F2	Fuse, Ctg	FU102-5
K1 thru K4	Rel, Arm, DPDT	RL168-2C10-115AC
K5	Rel, Arm, 4PDT	RL156-8
K6	Same as K5	
K7	Same as K5	
K8 thru K11	Not used	
K12 thru K14	Same as K5	
K15 thru K17	Rel, Arm, DPDT	RL156-1
K18 thru K21	Not used	
K22 thru K24	Same as K15	
S1	Switch, Toggle, DPST	ST22K
XDS1	Lamp, Holder	TS106-2
XDS2	Lamp, Holder	TS106-1

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
XF1	Fuse Holder	FH100-1
XF2	Same as XF1	
XK1 thru XK4	Socket, Rel, Oct	TS101-P01
XK5 thru XK7	Socket, Rel	TS171-3
XK8 thru XK11	Not used	
XK12 thru XK14	Same as XK5	
XK15 thru XK17	Socket, Rel	TS171-1
XK18 thru XK21	Not used	
XK22 thru XK24	Same as XK15	