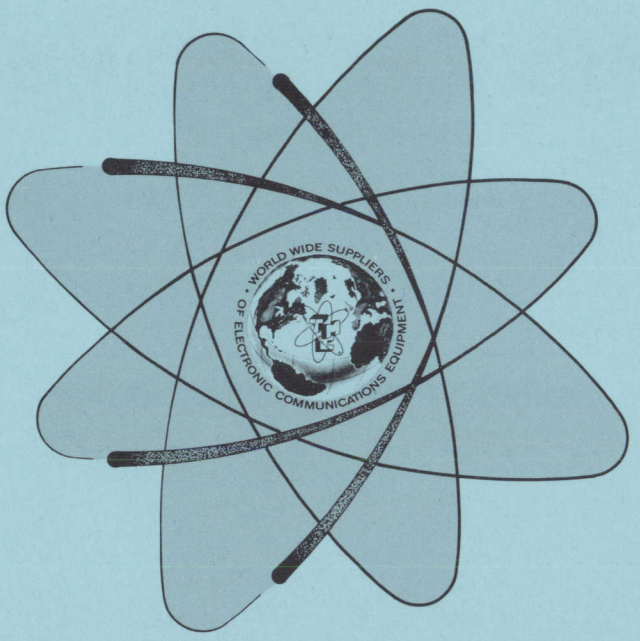
SERVICE MANUAL

for

HIGH FREQUENCY LINEAR POWER AMPLIFIER

MODEL TMA-350



THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N.Y. OTTAWA, ONTARIO

Printed in U.S.A.

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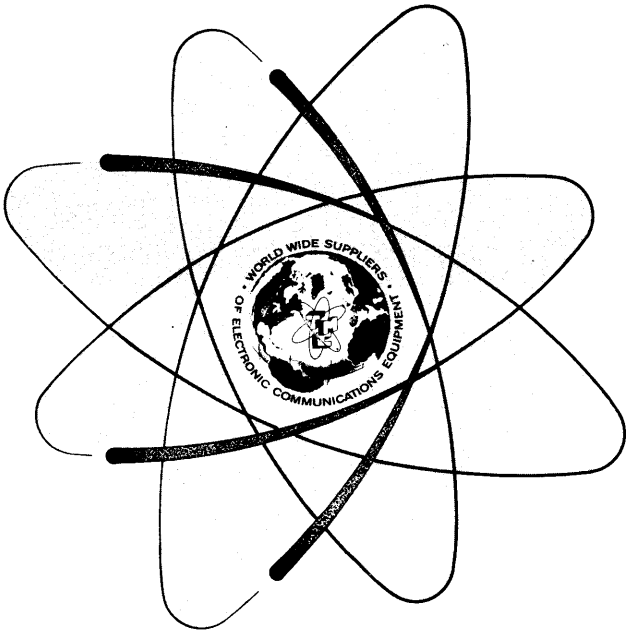

THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N.Y. OTTAWA, ONTARIO

Printed in U.S.A.

IN 1059-2 ISSUE DATE: MARCH 1971

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

RECORD OF CORRECTIONS MADE

Change No.	Date of Change	Date Entered	Entered By

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SECTION 4 - DRAWINGS AND PARTS LISTINGS

SCOPE OF MANUAL

The servicing techniques for the TM350, High Frequency Linear Power Amplifier (hereinafter referred to as the TM350) are covered in this service manual under the following categories:

a. Preventive maintenance procedures are contained in Section 1 to provide a basis for recognizing future probable causes of equipment malfunction. By adhering to a stringent program of preventive maintenance, the most probable causes of equipment malfunction can be avoided, thereby minimizing equipment downtime and the possibility of comprimising important schedules.

b. Troubleshooting procedures are contained in Section 2 to provide a quick and logical means for localizing the cause of an equipment malfunction.

c. Alignment procedures are contained in Section 3 to facilitate maintaining the TMA350 in a satisfactory operating condition. Alignment and adjustment of the unit may become necessary when the periodic checks of preventive maintenance indicate equipment deterioration or when equipment malfunctions require replacement of assemblies or components.

d. The drawings and parts listing for servicing the TMA350 are contained in Section 4. These include a schematic diagram and parts listing.

SECTION 1

PREVENTIVE MAINTENANCE

1-1. INSPECTION AND TESTING.

The following paragraphs describe equipment inspection and power supply checks to be performed on a monthly and weekly basis, respectively.

a. GENERAL INSPECTION. The most important and least expensive tool in the preventive maintenance program is visual inspection. Assemblies and their components should be examined periodically for tell-tale signs of deterioration prior to equipment malfunction and failure. Table 1-1 provides a monthly inspection checklist for the TMA350.

TABLE 1-1. MONTHLY INSPECTION ROUTINE

Assembly	Check
AC Line Power Cord, or DC Power Cables	Check AC line power cord or DC power cables for cracks, nicks or fraying.
Main Chassis Assembly	1. Check underside of chassis for dirt and dust.
	2. Check all interconnect wiring for cracks, nicks or fraying.
	3. Check all ground connections for security.
Front and Rear Panels	1. Check panel for general cleanliness.
	2. Check all control knobs for smooth action from limit-to-limit; check all switches for positive action.
	3. Check meter face for cracks, scratches, etc.
	4. Check all input and output jacks for security against panel.
	5. Remove both AC and DC fuses. Check to insure that the fuses are the proper value (5 amp for AC and 3 amp for DC) and that they are not open.

b. POWER SUPPLY CHECKS. The following power supply checks should be performed on a weekly basis:

(1) Set AC/OFF switch to OFF and HV/STDY-BY switch to STD-BY.

(2) Connect line power cord from vac power source to P1. Set AC/OFF switch to AC. Observe that the filament of V1 is illuminated, front panel FAN indicator is illuminated, and fan operates.

(3) Check ac filament voltage across pins 5 and 6 of V1. Filament voltage should be 6v ac ±15%.

(4) Connect the TMA350 to a 20-watt transmitting source, such as the TM125. Connect a 50-ohm dummy load or antenna to RF OUT connector J3.

(5) Use CAUTION and measure the plate voltage on power amplifier V1 by setting HV/STD-BY switch to HV and closing the push-to-talk line. The plate voltage should be approximately 1,350 vdc.

c. FUNCTIONAL TESTS. Perform the following checkout procedure on the TMA350 on a weekly basis after completing a check of the power supply.

(1) Set AC/OFF switch to AC and HV/STD-BY switch to HV.

(2) Close the push-to-talk line.

(3) Set the RF/IP meter switch to IP. The Meter should indicate 40 to 60 ma.

(4) Set the RF/IP meter switch to RF. The Meter should indicate 90 to 100 on c-w operation and should not exceed 110 on peaks in push-to-talk operation.

1-2. CLEANING INSTRUCTIONS.

In general, the TMA350 should be cleaned once a month, using a soft camel's hair brush, forced air pressure of not more than 20 psi, and a suitable cleaning agent such as trichloroethylene or methylchloroform.

WARNING

When using toxic solvents, make certain that adequate ventilation is provided; prolonged or repeated breathing of the vapor shall be avoided. Avoid prolonged or repeated contact with skin. Flammable solvents shall not be used on energized equipment from which a spark may be received.

CAUTION

Trichloroethylene contains a paint removing solvent; avoid contact with painted surfaces.

Remove dirt or grease from wiring and chassis surfaces using cleaning solvent; dry with compressed air. Remove dust with a soft camel's hair brush. Blow out accumulated dust from inaccessible areas of chassis using forced air.

SECTION 2

TROUBLESHOOTING

2-1. GENERAL.

a. EXTERNAL INPUTS CHECKS. Prior to troubleshooting the TMA350, it should be determined that the TMA350 unit itself is definitely the cause of failure and not faulty related equipment that is external to the TMA350. This may be accomplished by checking for proper power supply voltages, using the front panel Meter, and checking for sufficient power from the associated transmitting unit. The following steps will help to determine that the TMA350 is the cause of malfunction within a system.

(1) Verify all power supply voltages (paragraph 1-1b).

(2) Perform the functional tests (paragraph 1-1c).

(3) Check that the input signal level to the TMA 350 is 20 watts, minimum.

2-2. TROUBLESHOOTING. (See figure 4-1.)

a. POWER SUPPLY SECTION.

(1) The TMA350 operates from a power source of 115 or 230 vac. Power amplifier tube V1 receives the required d-c voltages from the power supply section consisting of filament transformer T1 and power transformer T2. Setting AC/OFF switch S1 to AC applies a-c power to transformer T1 via a-c fuse F1 and thermal switch S6. The application of a-c voltage to T1 energizes fan motor B1, FAN indicator DS1, and applies 6 vac filament voltage to pins 5 and 6 of power amplifier tube V1.

(2) Setting HV/STD-BY switch to HV applies primary voltage to high voltage transformer T2. The split secondary winding of transformer T2 provides high voltage ac which is rectified by diodes CR2 through CR7 and filtered by capacitors C5 through C8, C11, C12 and C13, and coil L11. The resultant d-c voltage, at approximately 1,350 vdc, is routed through L4 and L3 to the plate of power amplifier tube V1. The second winding on transformer T2 provides approximately 30 vac to bridge rectifier CR1. The 30 vdc output is filtered by capactor C4. Front panel HV indicator is connected across the 30 vdc output of the bridge rectifier and lights to indicate application of high voltage. Bridge rectifier CR1 provides 30 vdc to the wiper rotary switch S5 to provide optional automatic antenna tuner channel selection. The 30 vdc is also applied through dropping resistor R18 which provides 24 vdc to PTT relay K1, output relay K2, and grid and plate overload circuitry Q1 and Q2.

b. RF SIGNAL FLOW.

(1) The r-f drive to the TMA350 is applied to RF IN connector J1, and applied to relay K1, with relays K1 and K2 in the de-energized state, the r-f input is routed through normally closed contacts of K1 and K2 and applied to RF OUT connector J3. Therefore, if PTT relay K1 is not energized, the drive input is routed directly to the output, bypassing power amplifier V1.

(2) When a ground potential or PTT closure is applied between pin 2 and 3 of J2, relay K1 is energized. Also, with K1 energized, a set of contacts closes and applies a ground to the coil of relay K2, energizing K2. With K1 energized, the r-f input is routed through closed contacts of K1, through coupling capacitor C21 to the cathode of power amplifier V1 via parasitic suppressor Z1. The input drive level applied to RF IN connector must be at least 20 watts to provide sufficient drive for V1. The resultant amplified output of V1 is then routed to preselected resonant components assembled on CHANNEL switch S4. The loading capacitor values and the appropriate loading coil inductance values are determined by customer frequency allotment.

(3) The r-f output is routed through loading coil L5 to output relay K2, which was energized via contacts on PTT relay K1. The amplified r-f output is then applied to RF OUT connector J3.

(4) A sample of the R-f output is tapped off and coupled to a rectifier circuit via capacitor C17. The resultant d-c voltage is applied to front panel Meter M1 via the RF position of S3 to obtain an indication of the TMA350 r-f output.

c. OVERLOAD CIRCUITRY.

(1) The TMA350 contains a protective overload circuit that protects the power amplifier tube against excessive plate current or grid current due to over modulation. When activated, the overload protection circuitry places the power amplifier tube at cutoff and reroutes the r-f input at J1 directly to the output connector J3, by de-energizing relay K1 (which de-energizes relay K2), bypassing the amplifier.

(2) When relay K1 is energized, resistor R14 is placed in series with resistor R19 and coil L2 to form the cathode resistance for V1. The voltage drop across resistor R14 is applied to diode rectifier CR8 via OVLD ADJ potentiometer R12. The rectified voltage is filtered by capacitors C10 and C44 and applied to the collector of SCR Q2. The base voltage of Q2 is applied from the +24 vdc supply, through resistor R13, and via the HV contacts of S2. When the cathode current of V1 exceeds 400 ma, the voltage drop across R14 and R12 are sufficient to trigger SCR Q2. With Q2 triggered, resistor R13 is effectively grounded, de-energizing relay K1. The triggering of Q2 also applies +24 vdc across overload indicator DS3 which is located behind the front panel Meter. The overload circuit is reset by setting S2 to STD-BY and then back to HV.

(3) The protective overload circuit also receives an input from the circuitry of Q1 which monitors the grid current of V1. Transistor is normal forward biased and effectively places the anode of diode CR9 at ground potential. When the grid of V1 draws current due to over modulation, transistor Q1 is back biased. As a result, a positive voltage is tapped from resistor R23 and applied to the collector of SCR Q2 via diode CR9, firing Q2, With Q2 triggered, the circuit operation is the same as described above to de-energize relay K1 and light the overload indicator DS3 behind the front panel Meter.

SECTION 3

ALIGNMENT

3-1. GENERAL.

This section contains the alignment procedures required to maintain the TMA350 in satisfactory operating condition.

3-2. TEST EQUIPMENT REQUIRED.

A dummy load and wattmeter, Waters 334, or equivalent is required to align the TMA350.

3-3. ALIGNMENT.

a. POWER AMPLIFIER TUNING.

(1) Set AC/OFF switch to AC and HV/STD-BY switch to HV.

(2) Set the RF/IP meter switch to RF.

(3) Close the push-to-talk line.

(4) Set CHANNEL switch to position 1 and adjust capacitor C22 for maximum indication on Meter.

(5) Repeat step 4 for channels 2 through 8, adjusting capacitors C23 through C29, respectively, for maximum indication on Meter.

b. TMA350 SIGNAL POWER INPUT.

(1) Disconnect the r-f cable from the associated exciter and connect dummy load and wattmeter to associated exciter r-f output.

(2) Set AC/OFF switch to AC and HV/STD-BY switch to HV.

(3) Energize the associated exciter and close the push-to-talk line.

(4) Adjust potentiometer R26 for 20 watts indication on wattmeter.

c. OVERLOAD PROTECTION ADJUSTMENT. The OVLD ADJ potentiometer R12 is adjusted to fire SCR Q2 when the cathode current of power amplifier V1 exceeds 400 ma. The potentiometer is preadjusted at the factory and should not require further adjustment.

SECTION 4

DRAWINGS AND PARTS LISTINGS

This section contains the drawing and parts listing for the TMA350. The diagram that is referenced in the troubleshooting and alignment sections is contained in this section. Figure 4-1 is the overall schematic diagram of the TMA350. Table 4-1 is the parts listing for the TMA350.

8 7 6

D

C

B

A

SHUNT CAPS ADDED AS NEEDED FOR LOWER FREQUENCY

S4, S5 SHOWN IN POS. 1

C29 C28 C27 C26 C25 C24 C23 C22

S4A

C15 .001

C16 .001

Z2

L3

L4

V1 8875

4,7,11

1,2,3,8,9,10,

C40 .1

R24 10 2W

Z1

+24V

R25 1.8K

R21 500 5W

R20 22K

R23 75

R22 1.8K

C45 .1

C39 .1

Q1 2N697

C41 .1

L2

C38 .1

R17 1.2K 2W

+24V

R18 27 2W

DS2

HV

+ C4 1000 50V

1350 VDC

B

CR1 DD130-200

F2 3A

C3 1000 5KV

C12 1000 5KV

L1

C11 1000

T2

1 3 2 4 7 9 5 6

S2B STD BY HV

S6

T1

AC F1 5A

S1 AC

FAN

FAN DS1 6VAC

C3 .1

R2 5 5W

CR2 IN2071 CR3 IN2071 CR4 IN2071

R1 5 5W

CR5 IN2071

CR6 IN2071

CR7 IN2071

C5 20 MFD

C6 20 MFD

C7 20 MFD

C8 20 MFD

R3 47K 2W

R4 47K 2W

R5 47K 2W

R6 47K 2W

R10

6 5 4

LOADING CAPACITOR
VALUES SELECTED
DEPENDING ON CUSTOMER
FREQ ALLOTMENT

S4B S4D S4C

C37 C36 C35 C34 C33 C32 C31 C30

L5

C14 1000 5KV

C17 10

CR10 IN914

R15 10K

C18 150

R16 1.2K

C19 .1

C20 .1

C21 .1

1350 VDC

R19 50 10W

+24V

K2

R14 3Ω 5W

K1

C3 1000 5KV

C12 1000 5KV

L1

C11 1000 5KV

CR4 IN2071

R3 47K 2W

C5 20 MFD

R4 47K 2W

C6 20 MFD

R5 47K 2W

C7 20 MFD

R6 47K 2W

C8 20 MFD

R10

+24V

R13 82 2W

TO S2

B

CR9 IN100

CR8 IN100

Q2 2N1595

C44 .1

C10 100 15V

R12 200

OVLD ADJ

C42 .1

R11 1.2K

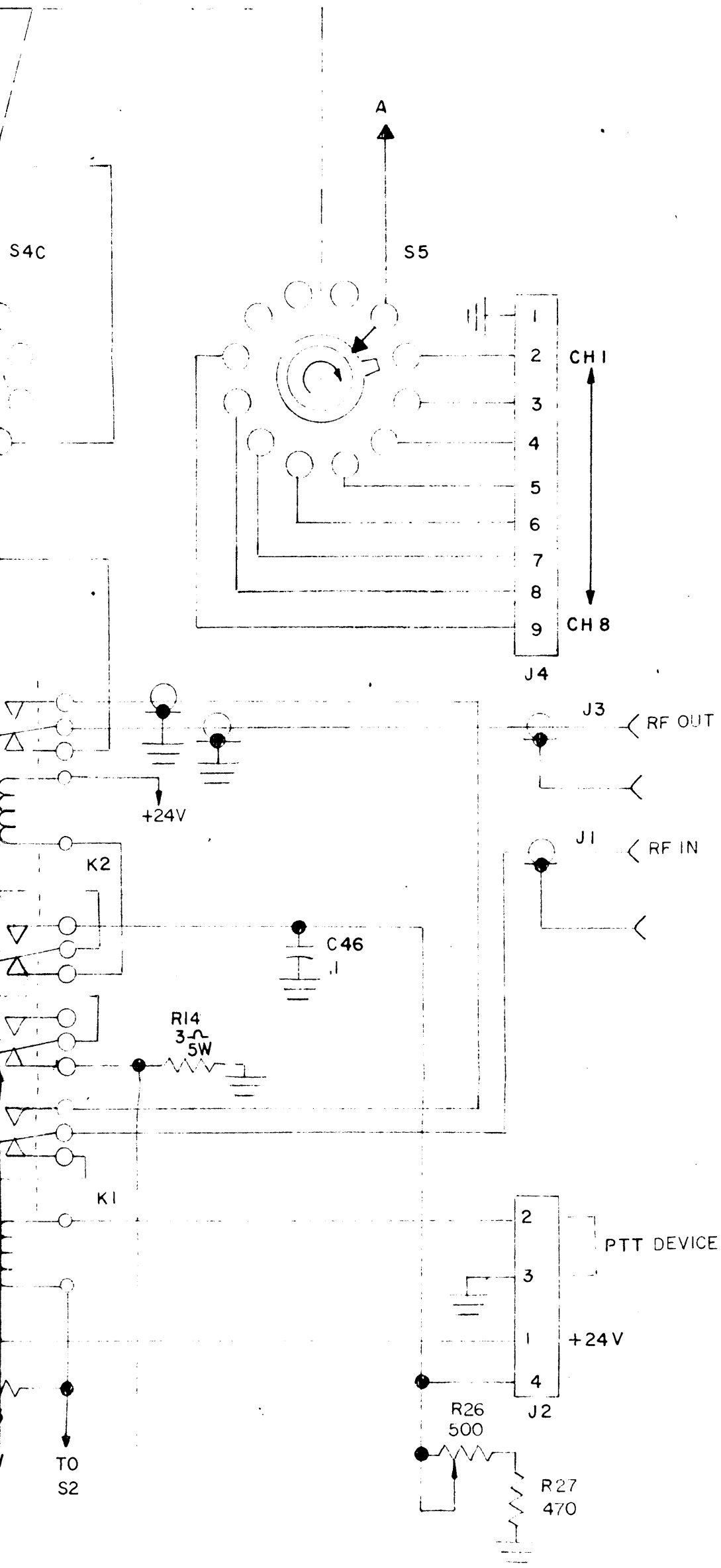
DS3

C43 .1

OVLD

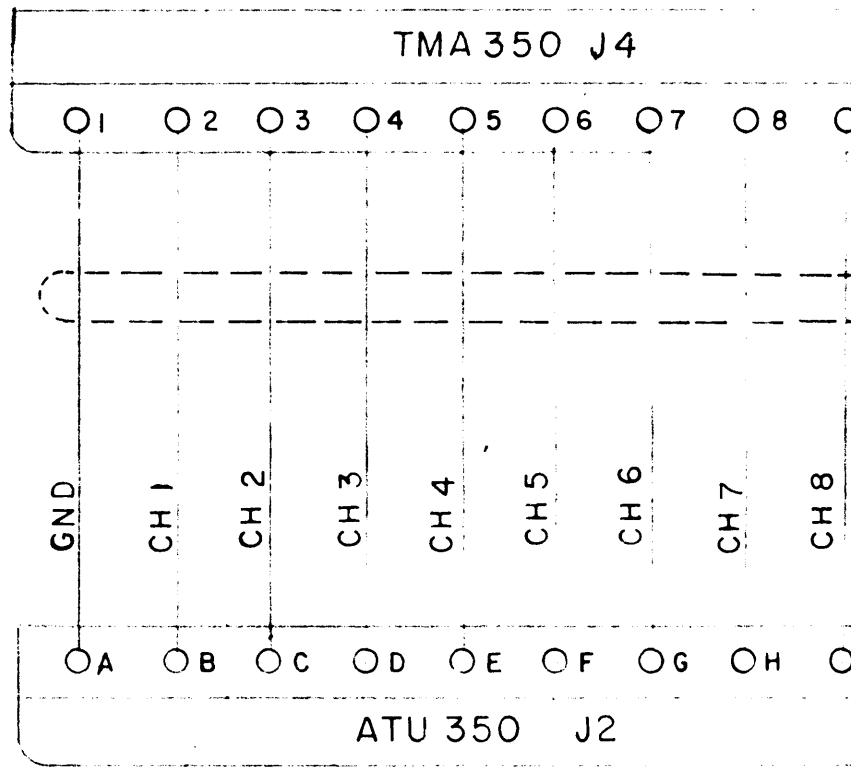
3	2	

REVISIONS					
E.M.N.NO	DRAFT	CHKD	ZONE	LTR	DESCRIPTION
				3	
				A	
				B	



NOTE :
FOR RF OUTPUT (J3) INTERFACING TO A
USE CABLE CA480-( ) LENGHT AS

FOR REMOTE USE WITH ATU-350 INTERFACE



* WAFERS PROGRAMMED TO FREQ. ALLOTMENT OF C

NOTE T1 & T2 FOR 230 V OPERATION REMOVE JUMPERS
3 & 4 - 1 & 2 . ADD JUMPER BETWEEN 2 &

K1 & K2 SHOWN ENERGIZED
UNLESS OTHERWISE SPECIFIED
ALL RESISTOR VALUES ARE IN OHMS 1/2W
ALL CAPACITOR VALUES ARE IN
ALL INDUCTOR VALUES ARE IN

LAST SYMBOL		MISSING SYMBOL
B1	P1	
C46		
CR10		
DS3		
F2		
J4		
K2		
L5		
M1		
Q2		
R27		
S 6		
T2		
V1		
Z2		

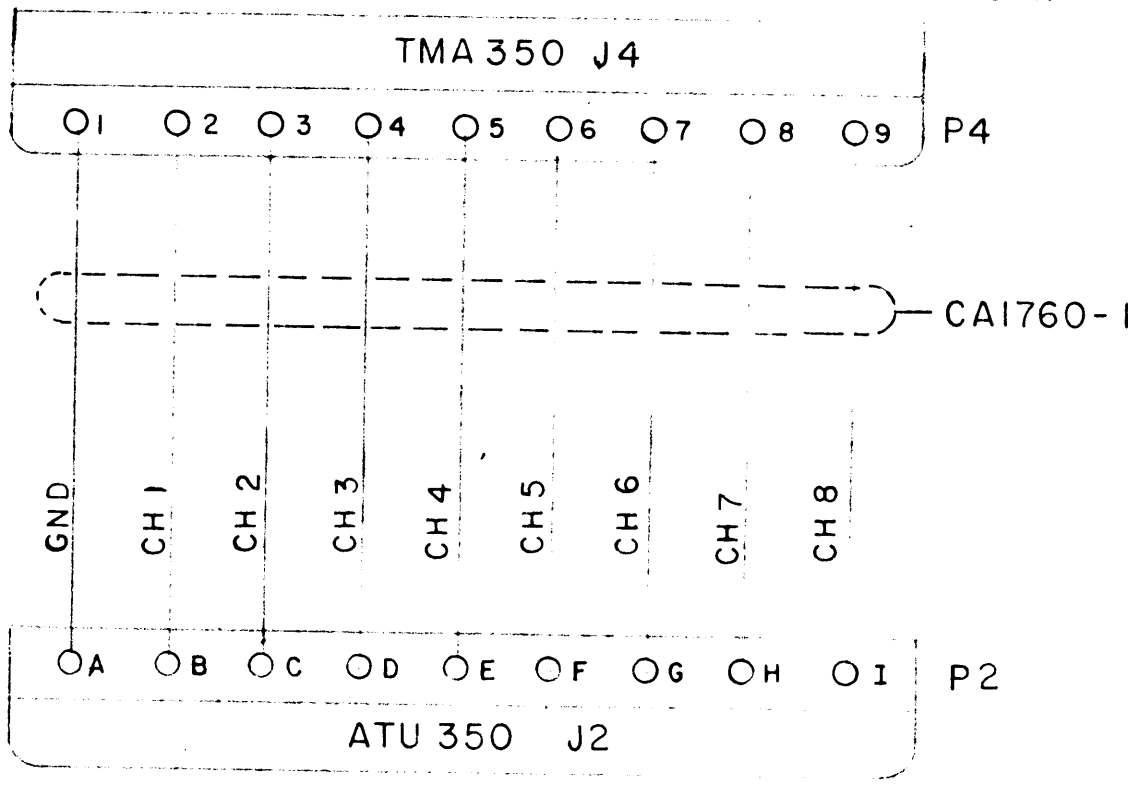
3 | 2 | 1

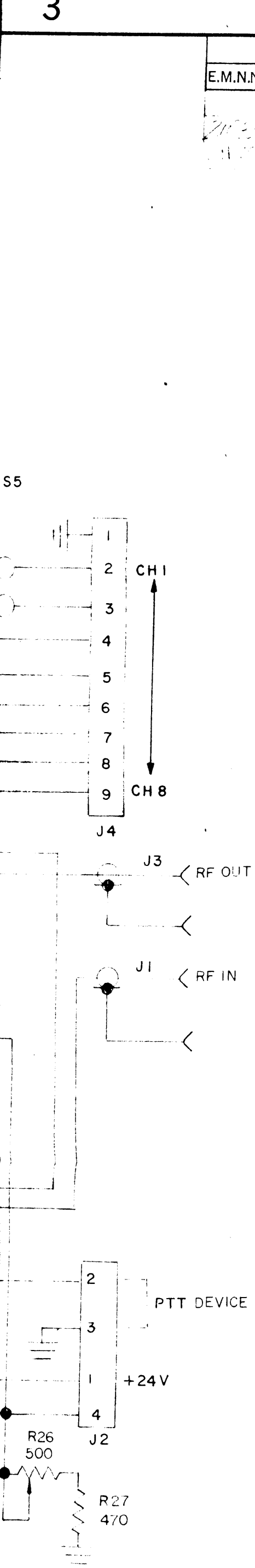
REVISIONS							
E.M.N.NO	DRAFT	CHKD	ZONE	LTR	DESCRIPTION	DATE	APPROVED
				A			
				B			

D

NOTE:
FOR RF OUTPUT (J3) INTERFACING TO ATU 350
USE CABLE CA480-( ) LENGHT AS REQ.

FOR REMOTE USE WITH ATU-350 INTERFACE AS SHOWN





* WAFERS PROGRAMMED TO FREQ. ALLOTMENT OF CUSTOMER.

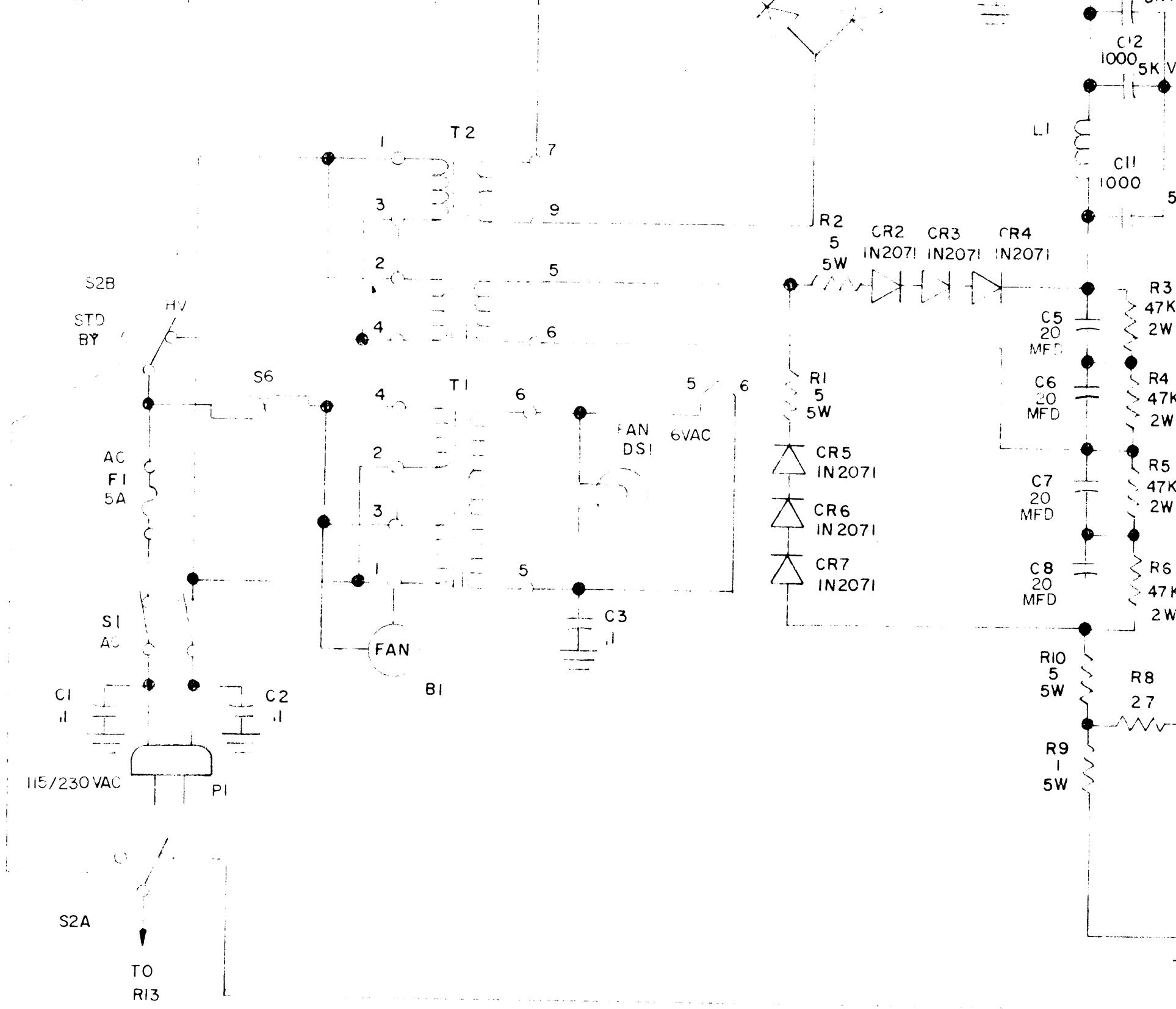
NOTE T1 & T2 FOR 230 V OPERATION REMOVE JUMPERS BETWEEN 3&4 - 1&2. ADD JUMPER BETWEEN 2&3.

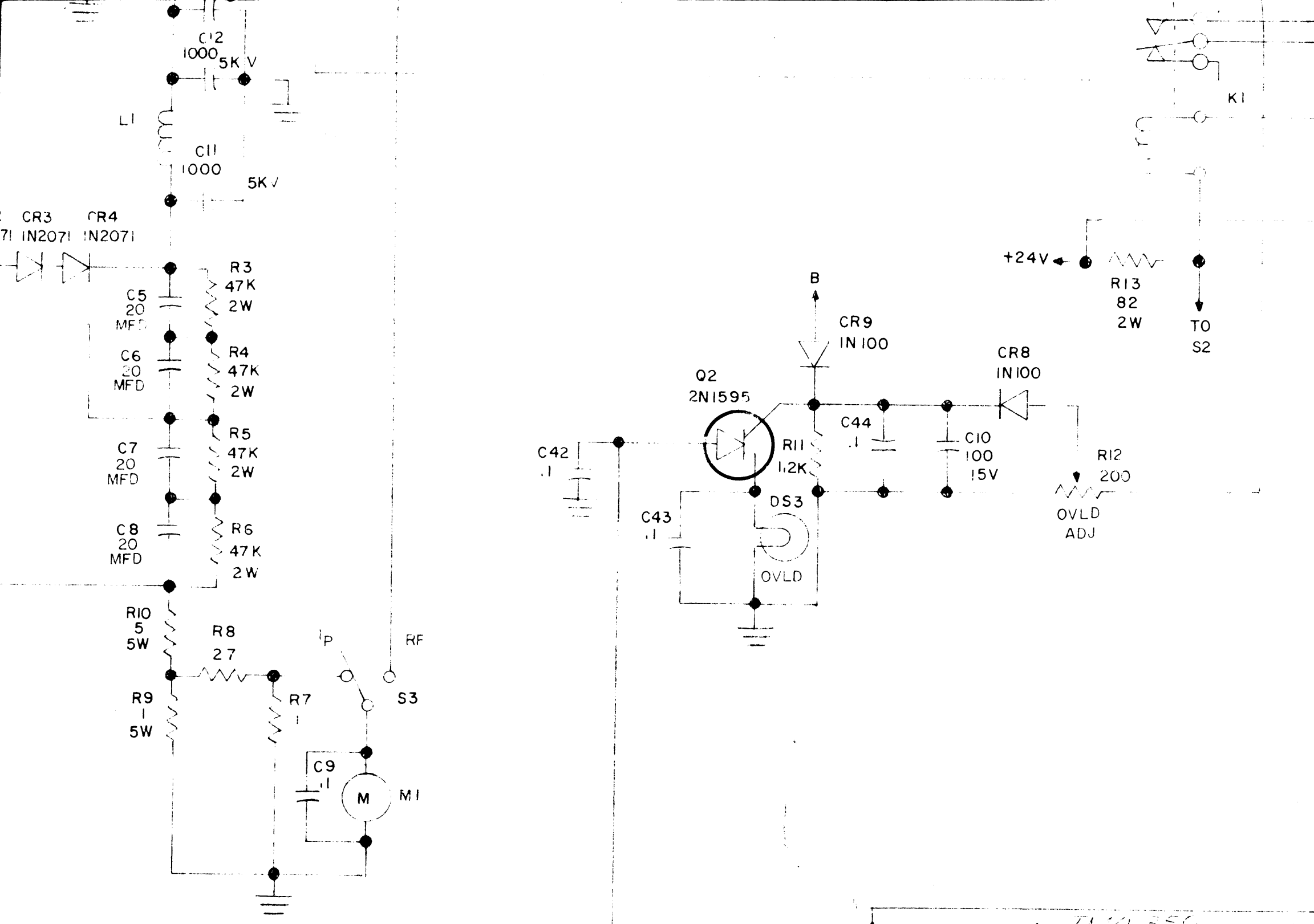
K1 & K2 SHOWN ENERGIZED
UNLESS OTHERWISE SPECIFIED
ALL RESISTOR VALUES ARE IN OHMS 1/2W
ALL CAPACITOR VALUES ARE IN
ALL INDUCTOR VALUES ARE IN

LAST SYMBOL	MISSING SYMBOL
B1 P1 C46 CR10 DS3 F2 J4 K2 L5 M1 Q2 R27 S6 T2 V1 Z2	

C

B

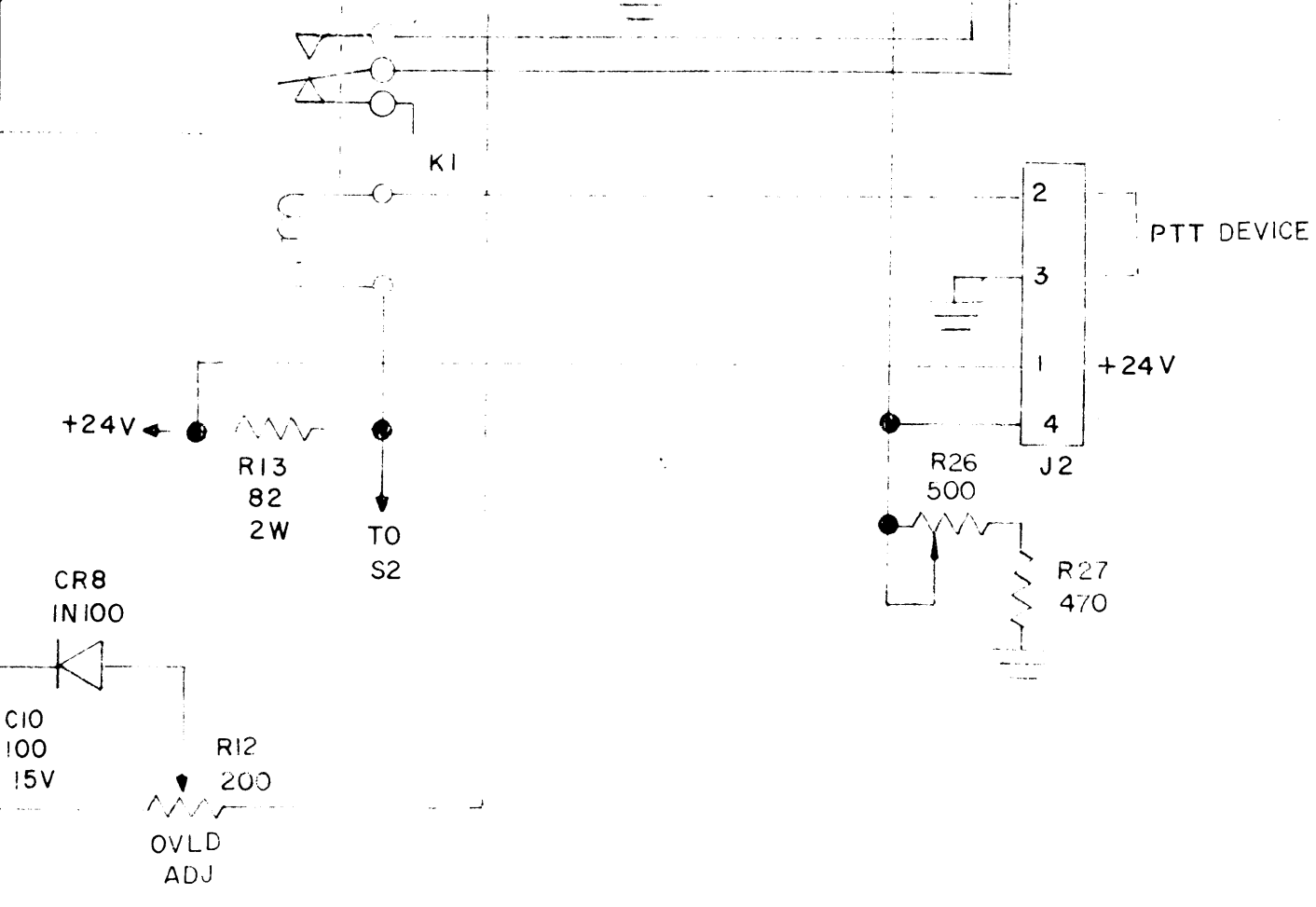

T2
T1
S2B
STD
BY
HV
S6
AC
F1
5A
S1
AC
C1
.1
C2
.1
115/230 VAC
P1
S2A
TO
R13
FAN
B1
FAN
DS1
6VAC
C3
.1
R2
5
5W
CR2
IN2071
CR3
IN2071
CR4
IN2071
R1
5
5W
CR5
IN2071
CR6
IN2071
CR7
IN2071
C12
1000
5K
L1
C11
1000
C5
20
MFD
C6
20
MFD
C7
20
MFD
C8
20
MFD
R3
47K
2W
R4
47K
2W
R5
47K
2W
R6
47K
2W
R10
5
5W
R8
27
R9
1
5W



	TX 171 550	
QTY / UNIT	MODEL USED ON	
	APPLICATION	
	CODE	

NOTICE TO PERSONS RECEIVING THIS DRAWING

THE TECHNICAL MATERIEL CORPORATION claims proprietary right in the mate
This drawing is issued in confidence for engineering information only and may not
to manufacture anything shown hereon without permission from **THE TECHNICAL MA**
to the user. This drawing is loaned for mutual assistance and is subject to recall a



K1 & K2 SHOWN ENERGIZED
UNLESS OTHERWISE SPECIFIED
ALL RESISTOR VALUES ARE IN OHMS
ALL CAPACITOR VALUES ARE IN
ALL INDUCTOR VALUES ARE IN

LAST SYMBOL		MISS
B1	P1	
C46		
CR10		
DS3		
F2		
J4		
K2		
L5		
M1		
Q2		
R27		
S 6		
T 2		
V1		
Z2		

QTY. REQ.	ITEM	PART NO.	DE
			LIST OF MATERI

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES		FINAL APPROVAL	DATE 3/10/83
		MECH. DES.	DATE
TOLERANCES ON DECIMALS .X ± .05, .XX ± .01, .XXX ± .005 FRACTIONS ± 1/64 ANGLES ± 0° -30'		ELECT. DES.	DATE
		CHECKED	DATE
		DRAWN	DATE
MATERIAL			
FINISH			

THE TECH
MAM

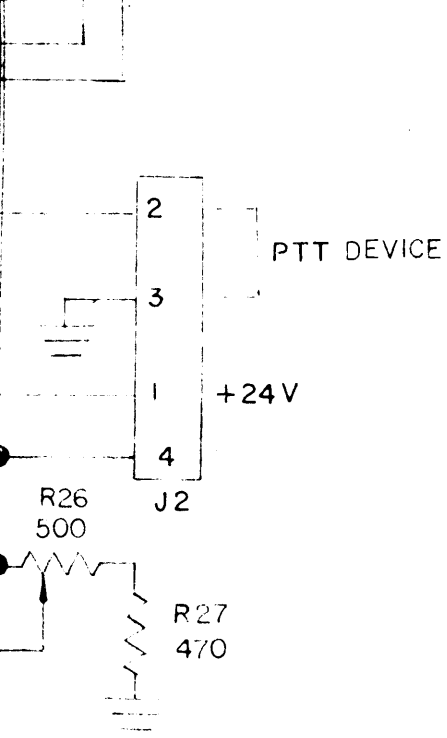
Figure 4

UNIT	MODEL USED ON	ASS'Y NO.
	TX/RX-250	

APPLICATION

CODE

4 3 2



K1 & K2 SHOWN ENERGIZED
UNLESS OTHERWISE SPECIFIED
ALL RESISTOR VALUES ARE IN OHMS 1/2W
ALL CAPACITOR VALUES ARE IN
ALL INDUCTOR VALUES ARE IN

LAST SYMBOL		MISSING SYMBOL
B1	P1	
C46		
CR10		
DS3		
F2		
J4		
K2		
L5		
M1		
Q2		
R27		
S6		
T2		
V1		
Z2		

B

QTY. REQ.	ITEM	PART NO.	DESCRIPTION	SYMBOL

LIST OF MATERIAL

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

TOLERANCES ON

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

MATERIAL

FINISH

FINAL APPROVAL		DATE 3/10/73
MECH. DES.		DATE
ELECT. DES.		DATE
CHECKED		DATE
DRAWN		DATE

THE TECHNICAL MATERIEL CORP.
MAMARONECK, NEW YORK

A

Figure 4-1. Overall Schematic Diagram, TMA-350

3 2 1

Table 4-1.

Parts list for TMA350

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
B1	Fan, Motor	MO153
C1	Capacitor, Fixed, Ceramic	CC100-37
C2	Same as C1	
C3	Same as C1	
C4	Capacitor, Fixed, Elect.	CE116-8VH
C5	Capacitor, Fixed, Elect.	CE108-1
thru		
C8		
C9	Capacitor, Fixed, Ceramic	CC100-42
C10	Capacitor, Fixed, Elect.	CE105-100-15
C11	Capacitor, Fixed, Ceramic	CC109-38
thru		
C14		
C15	Capacitor, Fixed, Mica Dielectric	CM45B102J
C16	Same as C15	
C17	Capacitor, Fixed, Mica Dielectric	CM15B100J
C18	Capacitor, Fixed, Mica Dielectric	CM15B151J
C19	Same as C9	
C20	Same as C9	
C21	Same as C1	
C22	Capacitor, Variable	CB118SRX200
thru		
C29		
C30	Capacitor, Fixed	
thru		
C37		*
C38	Same as C1	
C39	Same as C9	
C40	Same as C9	
C41	Same as C9	
C42	Same as C1	
C43	Same as C9	
C44	Same as C9	
C45	Same as C9	
C46	Same as C9	
CR1	Semiconductor, Device, Bridge rectifier	DD130-200
CR2	Semiconductor, Device, Diode	1N2071
thru		
CR7		
CR8	Semiconductor, Device, Diode	1N100
CR9	Same as CR8	
CR10	Semiconductor, Device, Diode	1N914
DS1	Lamp, Incandescent	B1-101-47
DS2	Lamp, Incandescent	B1-101-1819
DS3	Same as DS1	
F1	Fuse, 5 Ampere	FU-102-5
F2	Fuse, 3 Ampere	FU-102-3

* Note: Loading capacitor values selected depending on frequency allotment.

Table 4-1.

Parts list for TMA 350 (cont)

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
J1	Connector, R-f	UG625/U
J2	Connector, Receptacle	JJ-352
J3	Connector, R-f	JJ-214
J4	Connector, Receptacle	JJ-351
K1	Relay	RL116-3C-24-DC
K2	Relay	RL197
L1	Coil, R-f	CL178
L2	Same as L1	
L3	Coil, Hf	CL483
L4	Coil, Tank	CL479
L5	Coil, Loading	CL478
M1	Meter	MR232
Q1	Transistor	2N697
Q2	Transistor	2N1595
R1	Resistor, Fixed WW 5W	RW107-6
R2	Same as R1	
R3 thru R6	Resistor, Fixed, Composition	RC42GF473J
R7	Resistor, Fixed, Composition	RC20GF1R0J
R8	Resistor, Fixed, Composition	RC20GF2R75
R9	Resistor, Fixed, Composition	RR114-1.0
R10	Resistor, Fixed, Composition	RR114-5.0
R11	Resistor, Fixed, Composition	RC20GF122J
R12	Resistor, Variable	RV106UX10B201
R13	Resistor, Fixed, Composition	RC42GF820J
R14	Resistor, Fixed, Composition	RR114-3.0
R15	Resistor, Fixed, Composition	RC20GF103J
R16	Same as R11	
R17	Resistor, Fixed, Composition	RC42GF122J
R18	Resistor, Fixed, Composition	RC42GF270J
R19	Resistor, Fixed, Composition	RR116-50W
R20	Resistor, Fixed, Composition	RC20GF223J
R21	Resistor, Fixed, Composition	RR114-500
R22	Resistor, Fixed, Composition	RC20GF182J
R23	Resistor, Fixed, Composition	RC20GF750J
R24	Resistor, Fixed, Composition	RC42GF100J
R25	Same as R22	
R26	Resistor, Variable	RV4ATSA501A
R27	Resistor, Fixed, Composition	RC20GF471J
S1	Switch, Toggle	ST22K
S2	Same as S1	
S3	Switch, Toggle	ST12D
S4A,B,C	Switch, Wafer	WS115
S4D	Switch, Wafer	WS144
S5	Switch	SW473
S6	Switch, Thermal	SS100-1

Table 4-1.

Parts list for TMA350 (cont)

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
T1	Transformer, Filament	TF239
T2	Transformer, Power	TF382
V1	Tube, Electron	8875
XC1 thru XC8	Socket, Capacitor	TS165-P01
XDS1	Socket, Lamp	TS106-1
XDS2	Same as XDS1	
XDS3	Socket, Lamp	TS107-2
XF1	Holder, Fuse	FH101-1
XF2	Same as F1	
XV1	Socket, Tube	TS170-1
Z1	Parasitic Suppressor	AX561
X2	Same as Z1	