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UNCLASSIFIED

TECHNICAL MANUAL

*for*

GENERAL PURPOSE RADIO TRANSMITTER

MODEL SBT-1KPA1



THE TECHNICAL MATERIEL CORPORATION  
MAMARONECK, N.Y.

OTTAWA, ONTARIO

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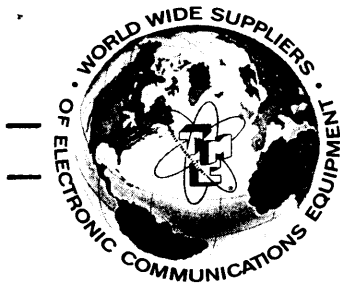
THE TECHNICAL MATERIEL CORPORATION  
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## NOTICE

THE CONTENTS AND INFORMATION CONTAINED IN THIS INSTRUCTION MANUAL IS PROPRIETARY TO THE TECHNICAL MATERIEL CORPORATION TO BE USED AS A GUIDE TO THE OPERATION AND MAINTENANCE OF THE EQUIPMENT FOR WHICH THE MANUAL IS ISSUED AND MAY NOT BE DUPLICATED EITHER IN WHOLE OR IN PART BY ANY MEANS WHATSOEVER WITHOUT THE WRITTEN CONSENT OF THE TECHNICAL MATERIEL CORPORATION.



# THE TECHNICAL MATERIEL CORPORATION

C O M M U N I C A T I O N S   E N G I N E E R S

700 FENIMORE ROAD

MAMARONECK, N. Y.

## W a r r a n t y

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



GENERAL PURPOSE RADIO  
TRANSMITTER  
MODEL SBT-1KPA1

1. DESCRIPTION

General Purpose Radio Transmitter, Model SBT-1KPA1 is the same as Model SBT-1KPA2, differing only in the equipment cabinets (RAK 11E1 and RAK-17E1) with associated connectors and blower assemblies. The SBT-1KPA1 also incorporates a transmit/receive switching unit, Model AX-198.

2. ACTION

Due to the similarity in function and operation of the SBT-1KPA1 versus the SBT-1KPA2, the following corrections and additions will enable the SBT-1KPA2 manual to be applicable to the SBT-1KPA1.

- a. All references to SBT-1KPA2 shall be interpreted to read as SBT-1KPA1.
- b. Figure 1-1 to be replaced by Figure 1-1 of this addendum.
- c. Figure 2-3 to be replaced by Figure 2-3 of this addendum. (CK1293).
- d. Figure 4-1b. to be replaced by Figure 4-1b. of this addendum.
- e. Cable/Wire Run List, Table 5-3 (pages 5-13 thru 5-15) to be replaced by Table 5-3 of this addendum.
- f. Parts List, Section 6 to be replaced by Parts List, Section 6 of this addendum.

### 3. PHYSICAL DESCRIPTION

The SBT-1KPA1 is contained in two equipment racks (RAK-11E1 and RAK-17E1), each measuring 62-5/8 inches high x 20-5/8 inches wide x 22-1/2 inches deep. The front of each rack is open to allow for mounting, maintenance and operation of the various components. The rear of each rack contains a door, which may be opened for maintenance purposes. A fan is mounted on the door of each rack to provide air circulation. Each rack contains two air filters; one adjacent to the fan, and one at the top of the rack.

See figure 1-1 for modular unit mounting locations and figures 2-3 and 2-4 for electrical interconnections.



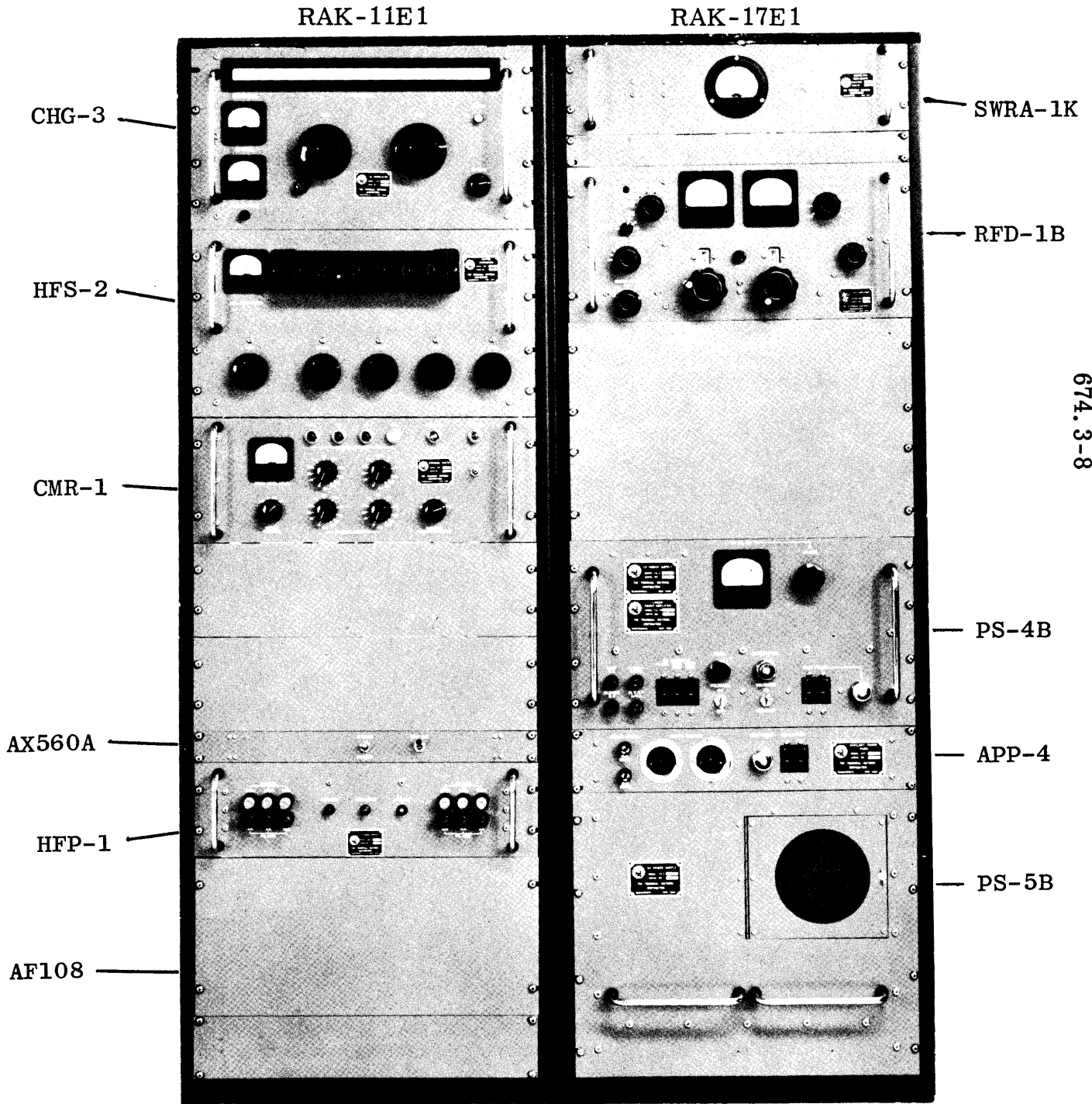


Figure 1-1. General Purpose Radio Transmitter, Model SBT-1KPA1

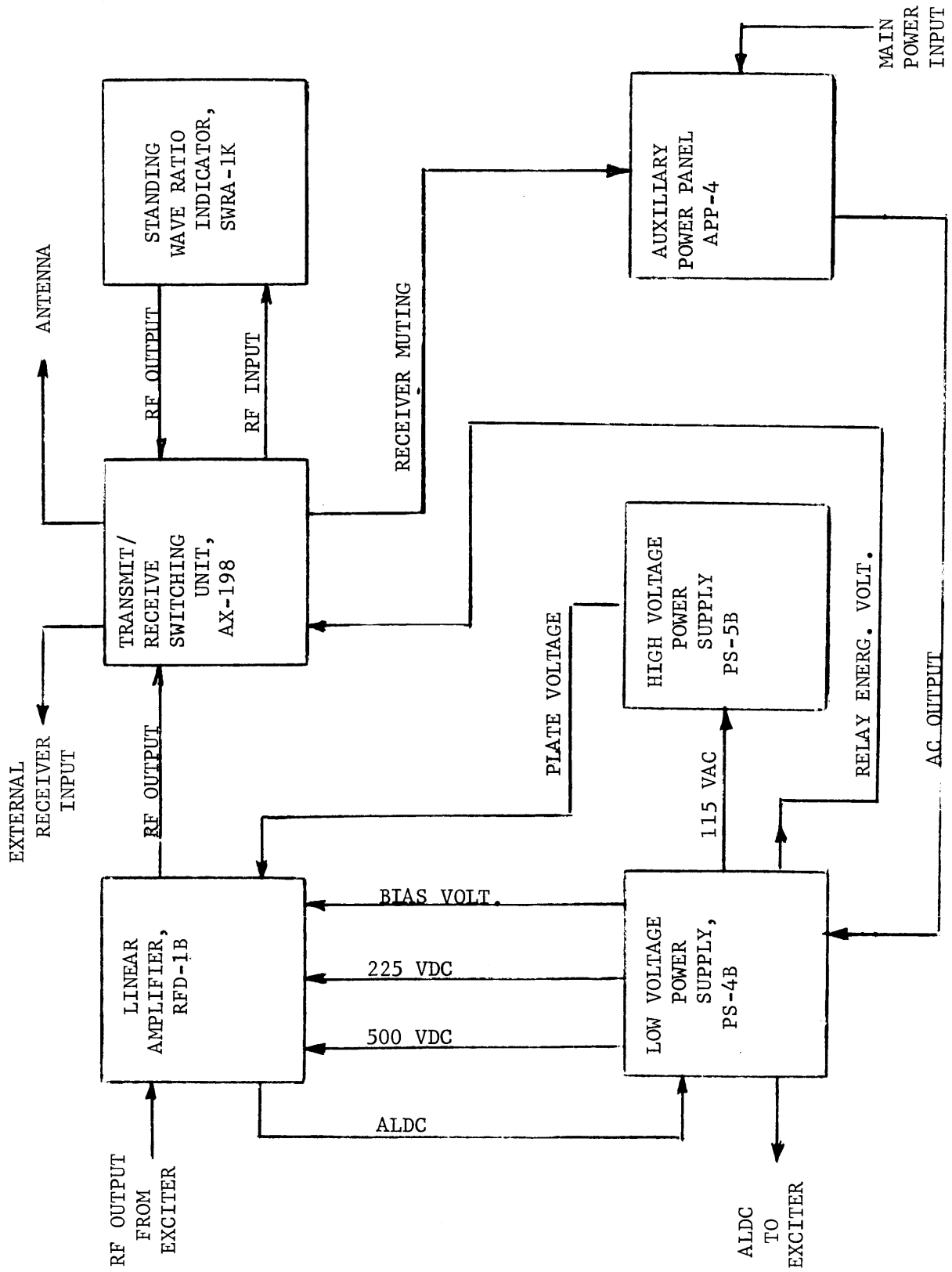


Figure 4-1.b. Block Diagram, Linear Amplifier

Table 5-3. Cable/Wire Run List

FROM				TO		
CABLE NO.	UNIT	TERMINATION	PIN	UNIT	TERMINATION	PIN
CA593	PS-4B	P614	A	MS1872	J605	A
			B			B
			C			C
			D			D
			E			E
			F			F
			G			G
			H			H
			I			I
			O			O
			P			P
			R			R
			S			S
			U			U
			V			V
			b			b
			c			c
			d			d
			e			e
			h			h
			j			j
			k			k
CA1328		P604	A	APP-4	*E502	22
			C			27
			D			29
CA1329			A	RAK	P626	D
			B	MS2806		D
			C			F
			D			G
		E701	10			C

\*Unit internal connection

Table 5-3. Cable/Wire Run List (Cont)

FROM				TO				
CABLE NO.	UNIT	TERMINATION	PIN	UNIT	TERMINATION	PIN		
CA1329	PS-4B	E701 ↑ ↓	5	AX-198	P607 ↑ ↓	A		
			6			H		
			9			F		
			4			E		
			1			A2036	E601	
			2			RAK	S601	
	3		S602					
	8	APP-4	*Ground					
	7		*E501	2				
	10		↓	9				
	RAK MS2806	P626 ↑ ↓	A	PS-4B	P604 ↑ ↓	B		
			D			A		
F			C					
G			D					
C			10					
B								
E	APP-4	*Ground						
H		*Ground						
		*E502	31					
APP-4	*E501 ↑ ↓	2	PS-4B	E701	7			
		3	AX-198	P607 ↑ ↓	H			
		4				A		
		5				J		
	8	K						
	*E502 ↑ ↓	22	PS-4B	P604	A			
27			↑	C				
29			↓	D				
31		RAK	P626	H				
		↑						

\* Unit internal connection

Table 5-3. Cable/Wire Run List (Cont)

FROM				TO		
CABLE NO.	UNIT	TERMINATION	PIN	UNIT	TERMINATION	PIN
CA480-3-80	PS-4B	P635		RAK	P636	
CA509		P601		APP-4	AC INPUT	
CA594	PS-5B	P615		MS1872	J604	
CA480-9-10F	RFD-1B	P612		RAK	P611	
CA480-135-18	SWRA-1K	P605		AX-198	P608	
CA480-135-24		P602			P610	
CA1328	RAK	S602			P607	L
		S601		A2038	E601	
		J602		APP-4	UTILITY AC	
CA493		J601			AC INPUT	

# SECTION 6

## PARTS LIST

### 6-1. INTRODUCTION

The parts list presented in this section is a cross-reference list of parts identified by a reference designation and TMC part number. In most cases, parts appearing on schematic diagrams are assigned reference designations in accordance with MIL-STD-16. Wherever practicable, the reference designation is marked on the equipment, close to the part it identifies. In most cases, mechanical and electro-mechanical parts have TMC part numbers stamped on them.

To expedite delivery when ordering any part, specify the following:

- a. Reference symbol.
- b. Description as indicated in parts list.
- c. TMC part number.
- d. Model and serial numbers of the equipment containing the part being replaced; this can be obtained from the equipment nameplate.

For replacement parts not covered by warranty (refer to warranty sheet in front of manual), address all purchase orders to:

The Technical Materiel Corporation  
Attention: Sales Department  
700 Fenimore Road  
Mamaroneck, New York

<u>Assembly</u>	<u>Page</u>
Rack, Equipment, Electrical, RAK-17E1 .....	6-2
Rack, Equipment, Electrical, RAK-11E1 .....	6-6

## PARTS LIST

for

## RACK ELECTRICAL EQUIPMENT, RAK-17E1

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
B600	NOT USED.	
B601	FAN, AXIAL: intake; 115 VAC, 50/60 cps; single phase; nominal RPM 1650; black anodize finish.	BL101
C600 thru C612	NOT USED.	
C613	CAPACITOR, FIXED, PAPER DIELECTRIC: 2 uf, $\pm 10\%$ ; 600 WVDC.	CP53BIEF205K1
E500-1	NOT USED.	
E501-1	TERMINAL BOARD, FANNING: 16 terminals, angle type, left end feed. (Supplied as loose item)	TM105-16AL
E501-2	TERMINAL BOARD, FANNING: 16 terminals, angle type, right end feed. (Supplied as loose item)	TM106-16AR
E600	NOT USED.	
E601	TERMINAL BOARD, BARRIER: two 6-32 thds. x 1/4" long binder head machine screws; black phenolic body.	TM102-2
J600	NOT USED.	
J601	CONNECTOR, RECEPTACLE, ELECTRICAL: 3 male contacts, polarized; current rating 30 amps, voltage rating 250 VAC/DC; twist lock type. Part of W609.	JJ297-1
J602	CONNECTOR, RECEPTACLE, ELECTRICAL: AC; 2 prong.	JJ100
J603	CONNECTOR, RECEPTACLE, ELECTRICAL: female.	MS3102A14S2S
J604	CONNECTOR, RECEPTACLE, ELECTRICAL: female. Part of W602.	MS3102A18-16S
J605	CONNECTOR, RECEPTACLE, ELECTRICAL: female. Part of W603.	MS3102A32-7S
MP600	NOT USED.	
MP601	FILTER, AIR CONDITIONING: replaceable type; aluminum mesh, steel frame; 10-1/8" x 9-7/8" x 1/2".	AD103-9

## PARTS LIST

for

## RACK ELECTRICAL EQUIPMENT, RAK-17E1

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
MP602	FILTER, AIR CONDITIONING: replaceable type; aluminum mesh, steel frame; 16 7/8" x 7 5/8" x 1/2".	AD103-5
P600	NOT USED.	
P601	CONNECTOR, PLUG, ELECTRICAL: female; 3 wire contact; current rating 20 amps at 250 VAC/DC or 10 amps at 600 VAC; polarized. Part of W604.	PL134NG
P602	CONNECTOR, PLUG, ELECTRICAL: 1-7/8" long x 13/16" diameter. Part of W606.	UG21*/U
P603	CONNECTOR, PLUG, ELECTRICAL: male.	MS3108A14S2P
P604	CONNECTOR, PLUG, ELECTRICAL: male. Part of W605.	MS3106B14S2S
P605	Same as P602. Part of W601.	
P606	CONNECTOR, PLUG, ELECTRICAL: 1 male contact, teflon dielectric; maximum peak operating voltage 5,000 volts, nominal impedance 50 ohms; series QDS with switch plate. (Supplied as loose item)	PL150
P607	CONNECTOR, PLUG, ELECTRICAL: female. Part of W605.	MS3106B20-27S
P608	CONNECTOR, PLUG, ELECTRICAL: UHF; 1 male coaxial contact, straight type; teflon dielectric. Part of W601.	PL259A-TEF
P609	CONNECTOR, PLUG, ELECTRICAL: AC; 3 prong with removeable ground connection; polarized. (Supplied as loose item)	PL218
P610	Same as P608. Part of W606.	
P611	Same as P608. Part of W608.	
P612	CONNECTOR, PLUG, ELECTRICAL: 1 male contact, styrene or rexolite dielectric; maximum peak operating voltage 500 V, nominal impedance 50 ohms; series BNC. Part of W608	UG260*/U
P613	Same as P609. (Supplied as loose item)	



## PARTS LIST

for

## RACK ELECTRICAL EQUIPMENT, RAK-17E1

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
P614	CONNECTOR, PLUG, ELECTRICAL: male. Part of W603.	MS3106B32-7P
P615	CONNECTOR, PLUG, ELECTRICAL: male. Part of W602.	MS3106B18-16P
P616 thru P619	NOT USED.	
P620	CONNECTOR, PLUG, ELECTRICAL: AC; 3 prong female. (Supplied as loose item)	PL190NG
P621 thru P623	NOT USED.	
P624	CONNECTOR, PLUG, ELECTRICAL: 31/32" long x 9/16" diameter, bayonet type; series BNC. (Supplied as loose item)	UG88*/U
P625	NOT USED.	
P626	CONNECTOR, PLUG, ELECTRICAL: male. Part of W605.	MS3106B20-27P
P627	CONNECTOR, PLUG, ELECTRICAL: 2 female contacts, rated for 10 amps at 250 VAC or 15 amps at 125 VAC. (Supplied as loose item)	PL100
P628 thru P634	NOT USED.	
P635	CONNECTOR, PLUG, ELECTRICAL: 1 male contact; maximum peak operating voltage 500 V; polarized; series BNC. Part of W607.	PL244-1
P636	Same as P635. Part of W607.	
S600	NOT USED.	
S601	SWITCH, PUSH-PULL: SPDT; 15 amps at 120/250 VAC; .2 amps at 250 WVDC.	SW230
S602	Same as S601.	
W600	NOT USED.	
W601	CABLE ASSEMBLY, ELECTRICAL: RF; consists of 2 connectors, symbols P605, P608.	CA480-135-18

## PARTS LIST

for

## RACK ELECTRICAL EQUIPMENT, RAK-17E1

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
W602	CABLE ASSEMBLY, ELECTRICAL: hi-voltage; consists of 2 connectors, symbols J604, P615.	CA594
W603	CABLE ASSEMBLY, ELECTRICAL: special purpose; consists of 2 connectors, symbols J605, P614.	CA593
W604	CABLE ASSEMBLY, ELECTRICAL: power; consists of 1 connector, symbol P601.	CA509
W605	WIRING HARNESS, BRANCHED: consists of 3 connectors, symbols P604, P607, P626.	CA1328
W606	CABLE ASSEMBLY, ELECTRICAL: RF; consists of 2 connectors, symbols P602, P610.	CA480-135-24
W607	CABLE ASSEMBLY, ELECTRICAL: RF; consists of 2 connectors, symbols P635, P636.	CA480-3-80
W608	CABLE ASSEMBLY, ELECTRICAL: RF; consists of 2 connectors, symbols P611, P612.	CA480-9-10F
W609	CABLE ASSEMBLY, ELECTRICAL: power; consists of 1 connector, symbol J601.	CA493

## PARTS LIST

for

## RACK ELECTRICAL EQUIPMENT, RAK-11E1

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
B901	FAN, VENTILATING: 115 VAC, 50/60 cps, single phase; power rating 14 watts; 100 cfm free delivery.	BL106-2
B902	Same as B901.	
E901	TERMINAL STRIP, BARRIER: four 6-32 thd. x 1/4" long binder head machine screws; black bakelite body.	TM102-4
J901	CONNECTOR, RECEPTACLE, ELECTRICAL: 3 wire, current rating 15 amps at 250 V; black plastic insulation.	JJ337
J902	Same as J901.	
J903	Same as J901.	
J904 thru J908	NOT USED.	
J909	CONNECTOR, PLUG, ELECTRICAL: 3 wire; current rating 20 amps at 250 VAC/DC; locking type; polarized.	PL133NG
J910	CONNECTOR, RECEPTACLE, ELECTRICAL: AC; 2 prong.	JJ100
J911	CONNECTOR, PLUG, ELECTRICAL: female. Part of W905.	MS3108B20-27S
J912	CONNECTOR, RECEPTACLE, ELECTRICAL: 1 round female contact; straight type, series BNC to BNC. Part of W905.	JJ172
J913	Same as J912. Part of W905.	
J914 thru J917	Same as J912. Part of W903.	
MP901	FILTER, AIR CONDITIONING: replaceable type; aluminum mesh, steel frame; 10-1/8" x 9-7/8" x 1/2".	AD103-9
MP902	FILTER, AIR CONDITIONING: replaceable type; aluminum mesh, steel frame; 16-7/8" x 7-5/8" x 1/2".	AD103-5
P901	CONNECTOR, PLUG, ELECTRICAL: AC; 3 prong with removeable ground connection; polarized. Part of W901.	PL218

## PARTS LIST

for

## RACK ELECTRICAL EQUIPMENT, RAK-11E1

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
P902	CONNECTOR, PLUG, ELECTRICAL: 2 female contacts, rated for 10 amps at 250 V; polarized; twist lock, midget size; brown bakelite. Part of W901.	PL176
P903	Same as P901. Part of W902.	
P904	CONNECTOR, PLUG, ELECTRICAL: female. Part of W903.	MS3108B24-28S
P905	CONNECTOR, PLUG, ELECTRICAL: female. Part of W905.	MS3102A20-27S
P906	CONNECTOR, PLUG, ELECTRICAL: 1 male connector, polarized; current rating 10 amps at 250 V or 15 amps at 125 V; twist lock, midget size; black bakelite. Part of W904.	PL177
P907	CONNECTOR, PLUG, ELECTRICAL: 24 round number 20 male contacts; straight type. Part of W904.	PL212-3
P908	CONNECTOR, PLUG, ELECTRICAL: 14 round number 16 male contacts; straight type. Part of W904.	PL212-1
P909	Same as P908. Part of W904.	
P910	CONNECTOR, PLUG, ELECTRICAL: female. Part of W904.	MS3106A16S-5S
P911	CONNECTOR, PLUG, ELECTRICAL: 1 male contact; maximum peak operating voltage 500 V; polarized; series BNC. Part of W903.	PL244-1
P912	Same as P911. Part of W903.	
P913	CONNECTOR, PLUG, ELECTRICAL: 14 round number 16 female contacts; straight type. Part of W904.	PL212-2
P914 thru P921	Same as P911. Part of W903	
P922	Same as P913. Part of W904.	
P923	Same as P911. Part of W903.	
P924	Same as P911. Part of W903.	
P925	Same as P911. Part of W905	

## PARTS LIST

for

## RACK ELECTRICAL EQUIPMENT, RAK-11E1

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
P926	Same as P911. Part of W905.	
P927 thru P933	NOT USED.	
P934	CONNECTOR, PLUG, ELECTRICAL: female; 3 wire contact; current rating 20 amps at 250 VAC/DC or 10 amps at 600 VAC; polarized. (Supplied as loose item)	PL134NG
P935	CONNECTOR, PLUG, ELECTRICAL: 31/32" long x 9/16" diameter; bayonet type, series BNC. (Supplied as loose item)	UG88*/U
P936	Same as P935. (Supplied as loose item)	
TB902-1	TERMINAL BOARD, FANNING: 12 terminals; angle type, right end feed. (Supplied as loose item)	TM105-12AR
TB903-1	Same as TB902-1. (Supplied as loose item)	
TB1001-1	TERMINAL BOARD, FANNING: 18 terminals; angle type, left end feed.	TM105-18AL
TB1002-1	TERMINAL BOARD, FANNING: 3 terminals; angle type, left end feed. Part of W903.	TM105-3AL
TB1301-1	TERMINAL BOARD, FANNING: 4 terminals, angle type, right end feed. Part of W903.	TM105-4AR
W901	CABLE ASSEMBLY, ELECTRICAL: power; consists of 2 connectors, P901, P902.	CA555-4
W902	CABLE ASSEMBLY, ELECTRICAL: power; consists of 1 connector, P903.	CA575-5
W903	WIRING HARNESS, BRANCHED: consists of 17 connectors, J914, J915, J916, J917, P904, P911, P912, P914, P915, P916, P917, P918, P919, P920, P921, P923, P924 and 3 terminal boards, TB1001-1, TB1002-1 and TB1301-1.	CA1327
W904	WIRING HARNESS, BRANCHED: consists of 7 connectors, J911, J912, J913, P905, P925 and P926.	CA1326