TECHNICAL MANUAL

FOR

GENERAL PURPOSE

TRANSMITTER

MODEL SBT-1K C

FOREWORD

Technical Materiel Corporation's general purpose transmitters, models SBT-1K, frequently called sideband transmitters, have an output of 1 kilowatt (PEP) in the frequency range of 2 to 32 megacycles. Their principal use is sideband transmission, voice and/or FSK.

TMC's models SBT-1K consists of various combinations of modular equipment units; in this way many customer needs may be satisfied. For example, in model SBT-1K(C) (see following figure 1-1), the equipment units comprise (see following figure 1-2): SWR-1K, PAL-1KA (RFD-1A, PS-4A, PS-5), VOX-5, XFK, APP-4, and RAK-9C. The XFK creates FSK signals supplied by associated teletypewriters and, with the aid of VOX-5, translates the signals for sideband transmission via the PAL-1KA transmitter. Other SBT-1K models use the PAL-1KA transmitter with other exciter arrangements.

TECHNICAL MANUAL

FOR

GENERAL PURPOSE

TRANSMITTER

MODEL SBT-1K(C)

THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N. Y. OTTAWA, ONTARIO

1 August 1962

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FOR

GENERAL PURPOSE TRANSMITTER

MODEL SBT-1K(C)

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SYSTEM INSTALLATION AND OPERATION

(PART I)

Section 1 - Installation Instructions

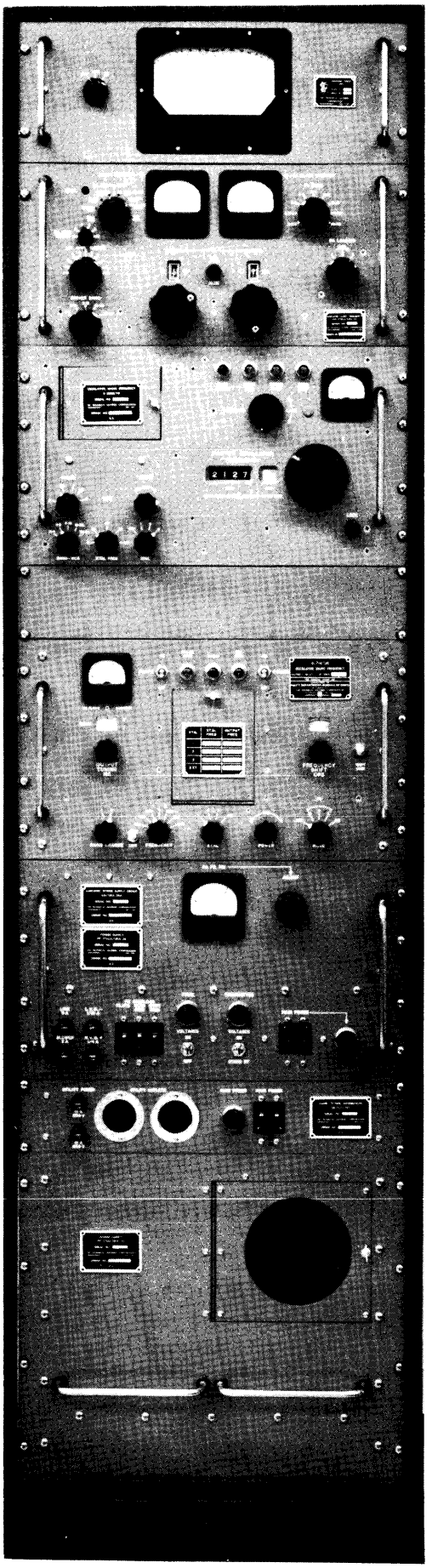


Figure 1-1. Front View of SBT-1K(C)

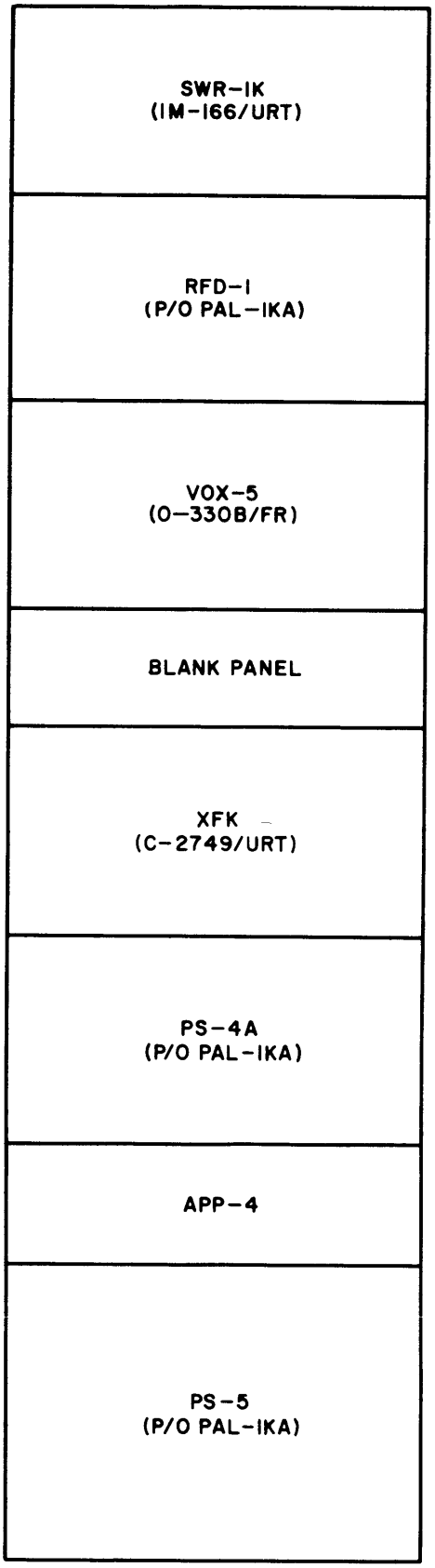


Figure 1-2. Block Diagram of SBT-1K(C)

Section 1 - INSTALLATION INSTRUCTIONS

1-1. Unpacking Instructions (figure 1-1 and 1-2).

The SBT-1K model (C) is shipped in 5 wooden cases, as shown in following table 1-1.

TABLE 1-1. SHIPPING DATA FOR SBT-1K, MODEL (C)

Case		Outside Dimensions (Length) (Width) (Height)	Volume (Cu. Ft)	Weights (lbs) Gross (Level A)	Net
1*	RAK-9 E/W APP-4 AX-198	78-1/2 x 23-1/8 x 31-1/2	35.6	485	330
2	SWR-1K	24-1/8 x 13 x 20-7/8	3.9	48	7
3	RFD-1A PS-4A	32-1/2 x 23-1/8 x 27	11.8	220	46 64
4	XFK VOX-5	32-1/2 x 23-1/8 x 27	11.8	239	46 68
5	PS-5	28-1/4 x 24-1/4 x 30-1/4	12.0	285	194

* Contains assorted items as follows:

1. MANUALS, TECHNICAL, 2 Each, TMC P/N IN-209-J Supplied as a loose item.
2. TEST DATA, 1 Each, Supplied as a loose item.
3. PLUG, ELECTRICAL, 1 Each, TMC P/N PL-149 Supplied as a loose item.
4. PLUG, ELECTRICAL, 1 Each, TMC P/N UG-59BU Supplied as a loose item.
5. EYE BOLT, 4 Each, TMC P/N SC-142 Supplied as a loose item.
6. EQUIPMENT MOUNTING HARDWARE KIT, 1 Each, Consisting of:
   40 each, Screw, Binderhead, TMC P/N ACBP1032BN8
   40 each, Washer, Fiber, TMC P/N WA-101-11

On arrival, uncrate each box and carefully inspect the equipment for damage. If any damage is found, notify the carrier or supply department immediately. Inspect all packing material for parts shipped as loose items.

The contents of the 5 boxes are packaged according to military specifications. The units are wrapped to avoid being scratched, placed in cartons, cushioned against shock, and wrapped and sealed with waterproof material within which the units are kept dry with a desiccant.

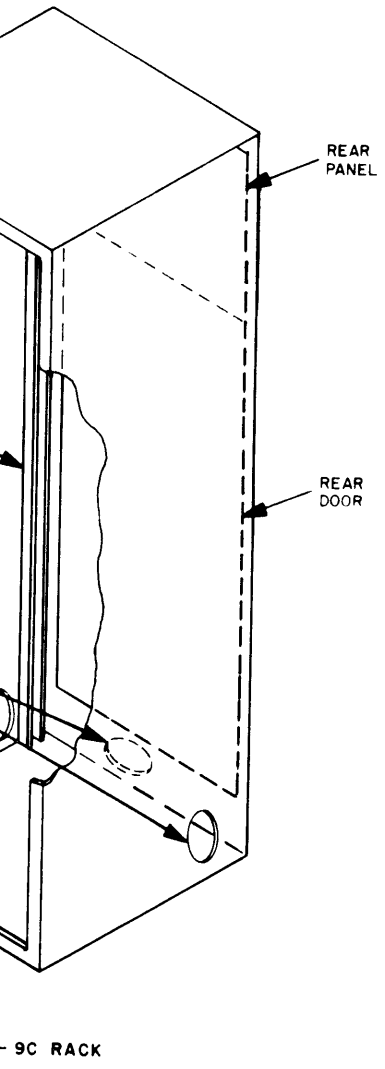
1-2. Installation and Interconnection of Units into Rack

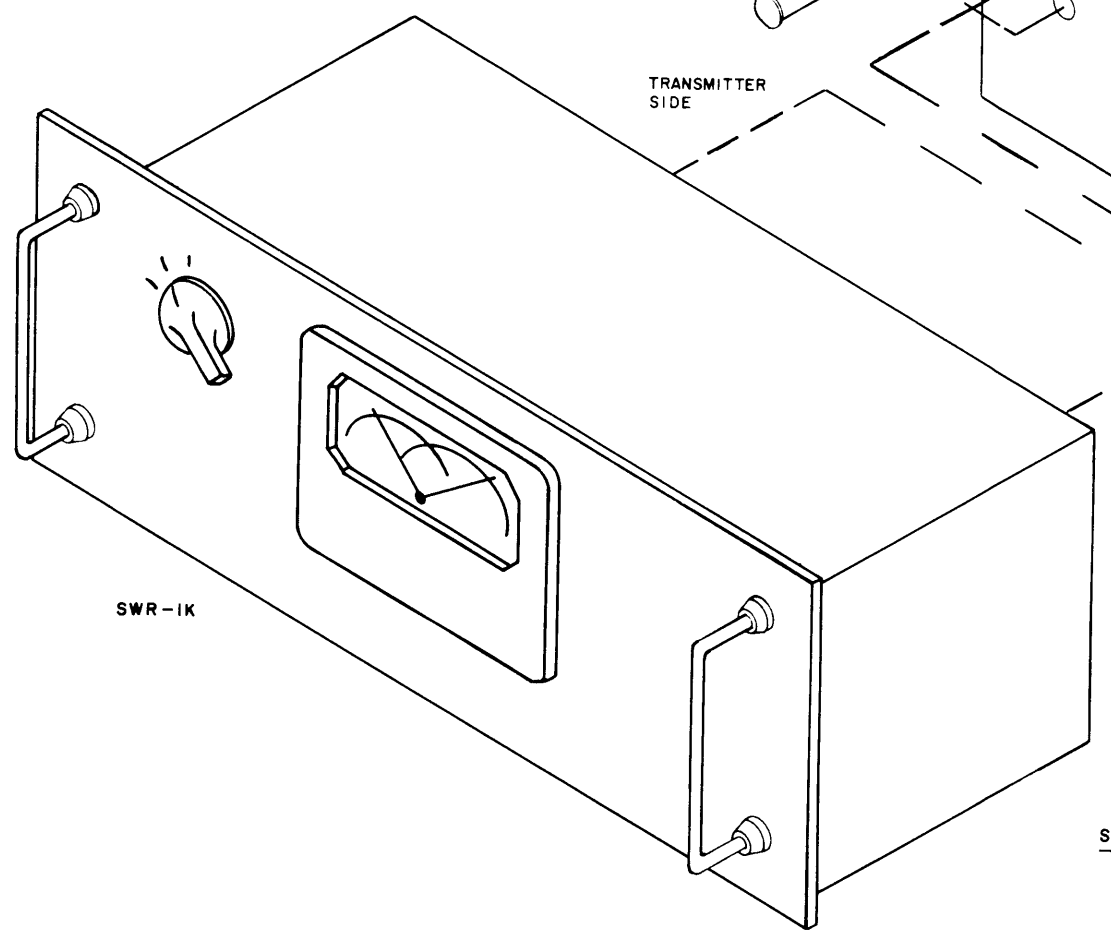
Figure 1-3 presents an isometric view of a RAK-9C rack which has three access holes, located near its bottom panel, for power and signal connections to the SBT-1K. Near the top of the RAK-9 rack are mounted the AX-198 assembly, the SWR-1K unit, and the RFD-1A unit. A wiring harness that interconnects various units of the SBT-1K is run in a channel in the rear left corner of the rack.

Figure 1-4 is a partial interconnection diagram showing the cabling between the AX-198 and closely associated units. RF input from the PAL-1KA transmitter unit occurs at E602. As seen from figure 1-3, the output from the RFD-1A is a button-type electrical contact and the mating electrical contact on the AX-198 is a spring-socket type.

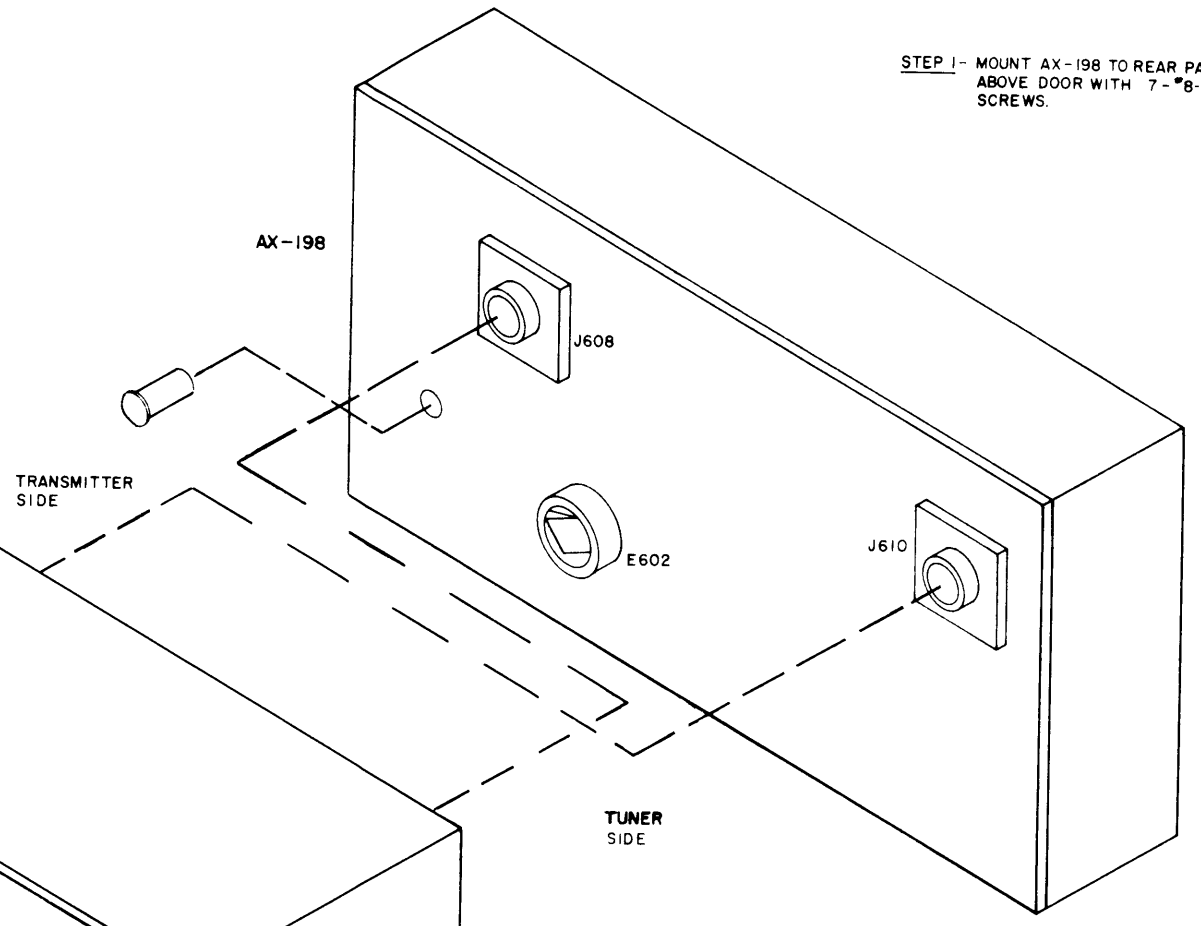
When the PAL-1KA is transmitting, RF traverses the antenna relay K601, emerging from J608 and is fed to SWR-1K. The path is clearly indicated in figure 1-4. The SWR-1K contains a bridge network that passes the RF to the antenna. Voltage standing wave indications appear on SWR-1K's meter which indicates forward watts, reflected watts, and VSWRs.

Cable CA-506 interconnects the AX-198 (with its antenna relay K601 and control/transfer relay K602) with closely associated circuits in PS-4A, APP-4, and RAK interlock circuits. As will be explained in





STEP 1- MOUNT AX-198 TO REAR PANEL ABOVE DOOR WITH 7 - #8-32 SCREWS.



STEP 2- MOUNT SWR-1K ON FRONT P/O FRAME WITH 4- # 10-32 SCREWS. (SWR-1K HAS NO DRAWER SLIDES)

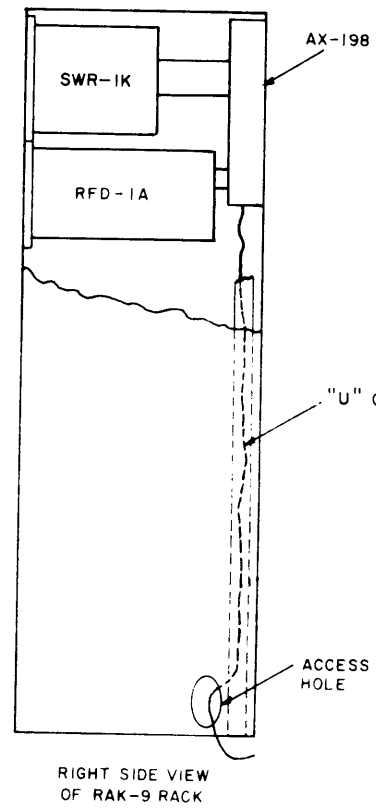
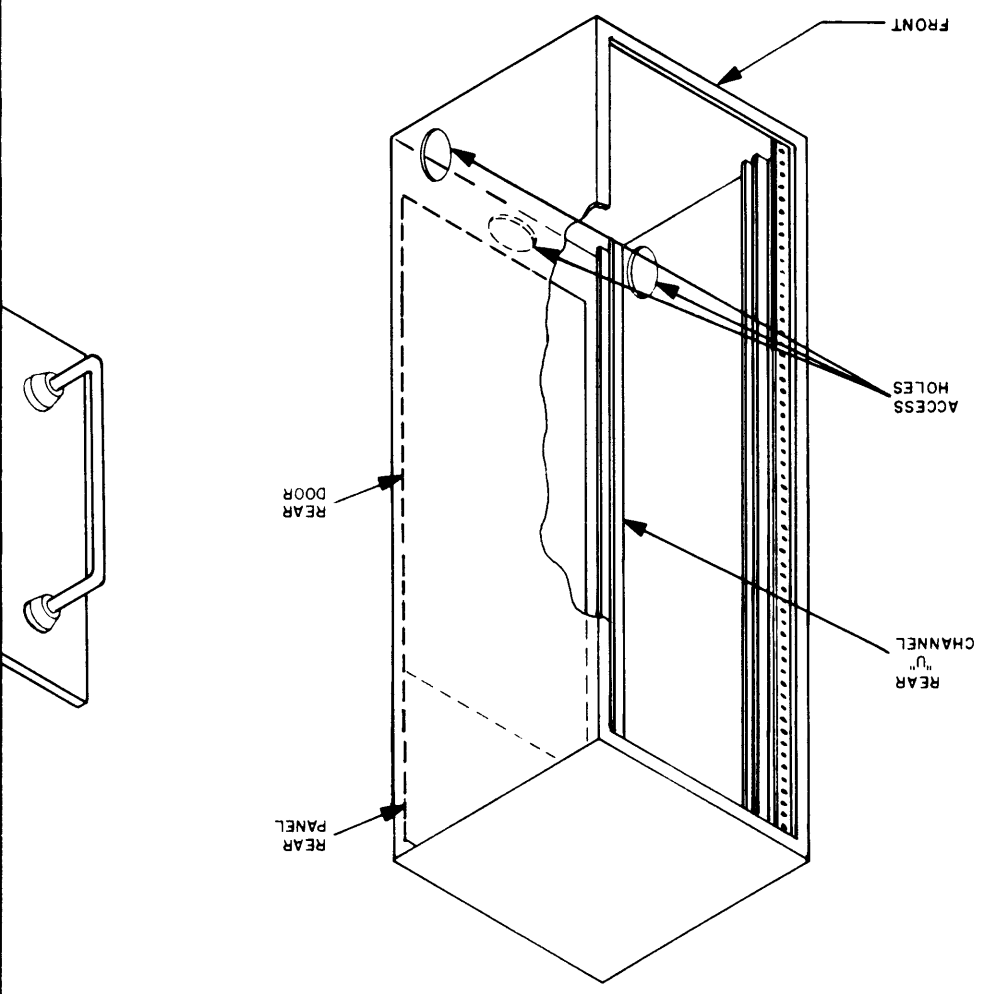


Figure 1-3. Isometric Diagram Illustrating Installation of AX-198 Assembly, SWR-1K, and RFD-1A in RAK-9C Rack

STANDARD RAK– 9C RACK



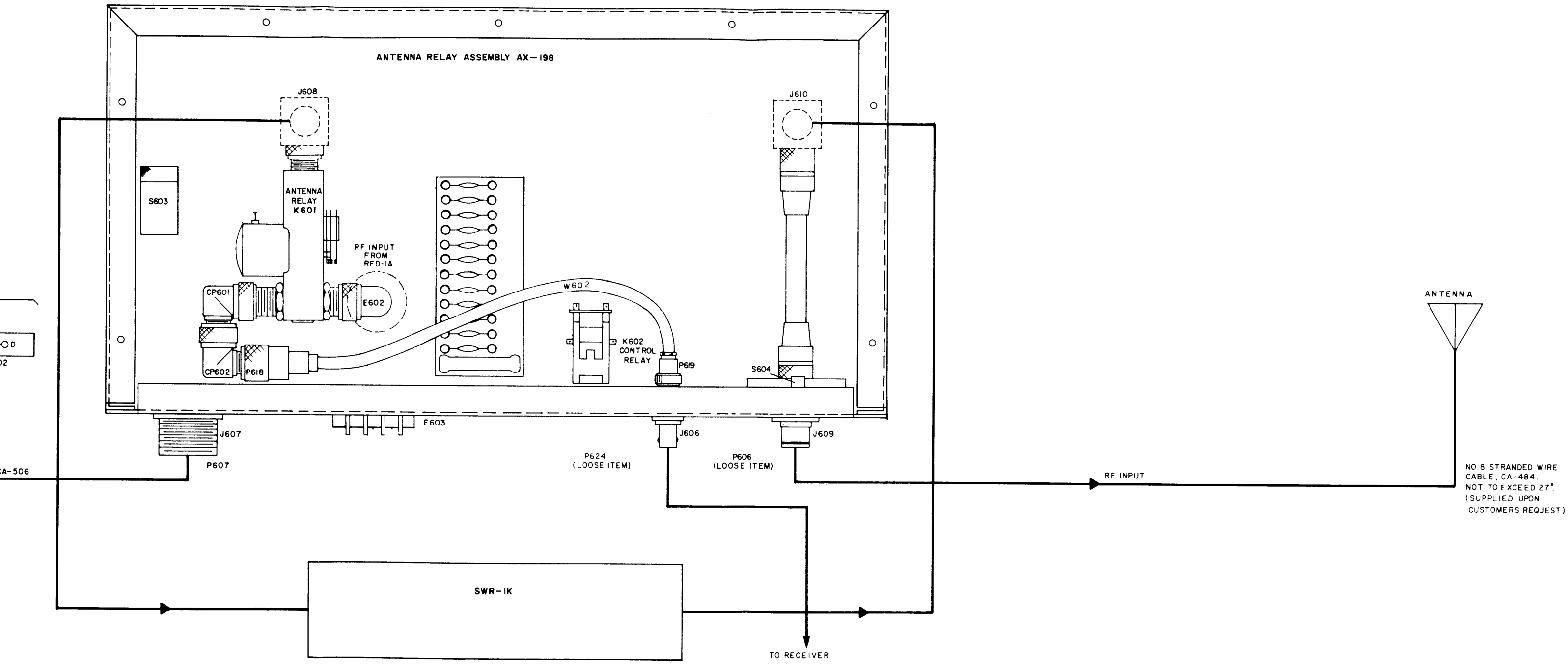
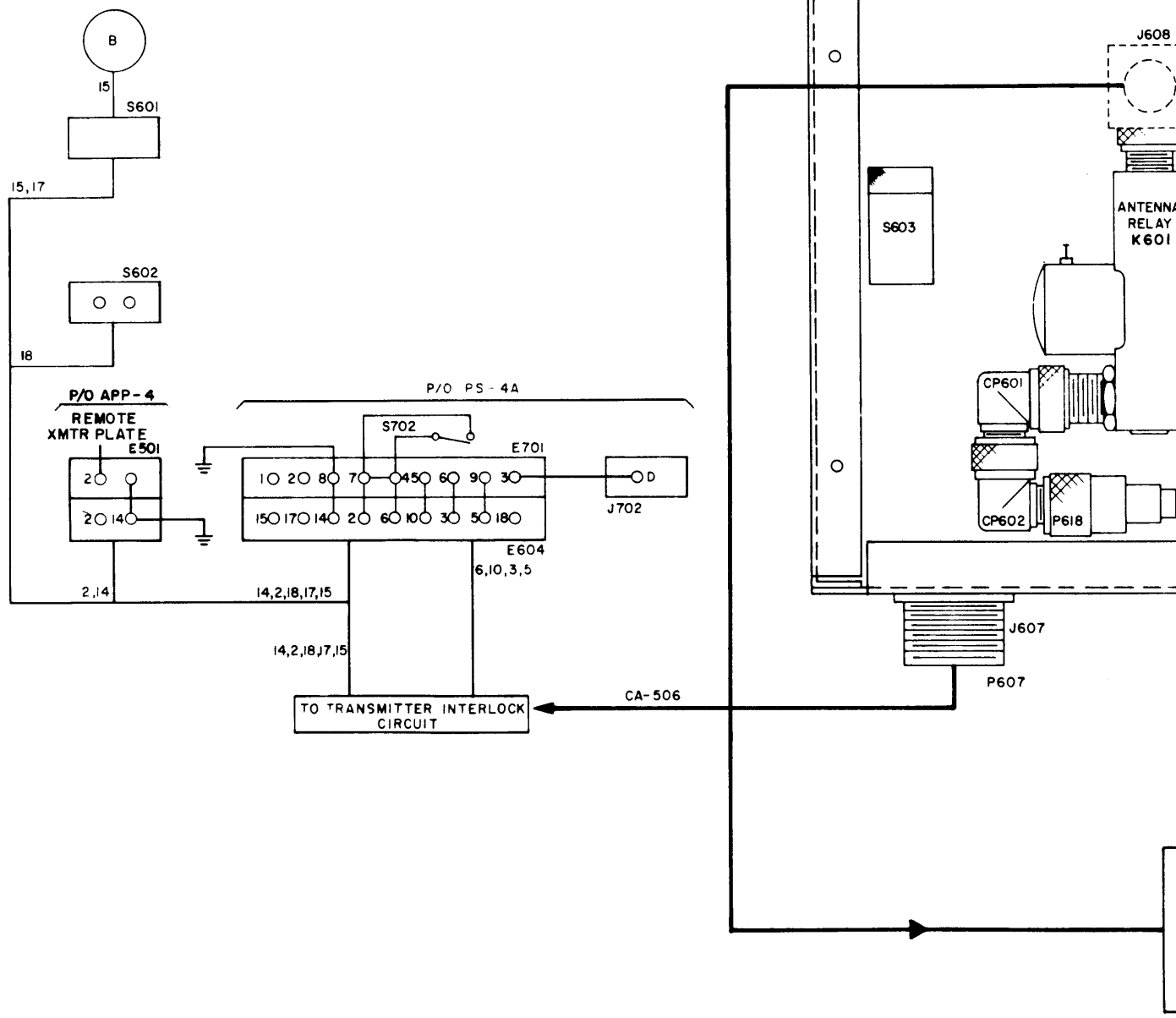


Figure 1-4. Partial Wiring Diagram Showing Interconnections of AX-198 Assembly and Closely Associated Units


B
15
S601
15,17
S602
18
P/O APP-4
REMOTE
XMTR PLATE
E501
2
2
14
2,14
P/O PS-4A
S702
E701
10 20 8 7 45 6 9 3
D
J702
15 17 14 2 6 10 3 5 18
E604
6,10,3,5
14,2,18,17,15
14,2,18,17,15
TO TRANSMITTER INTERLOCK CIRCUIT
CA-506
J608
S603
ANTENNA
RELAY
K601
CP601
CP602
P618
J607
P607

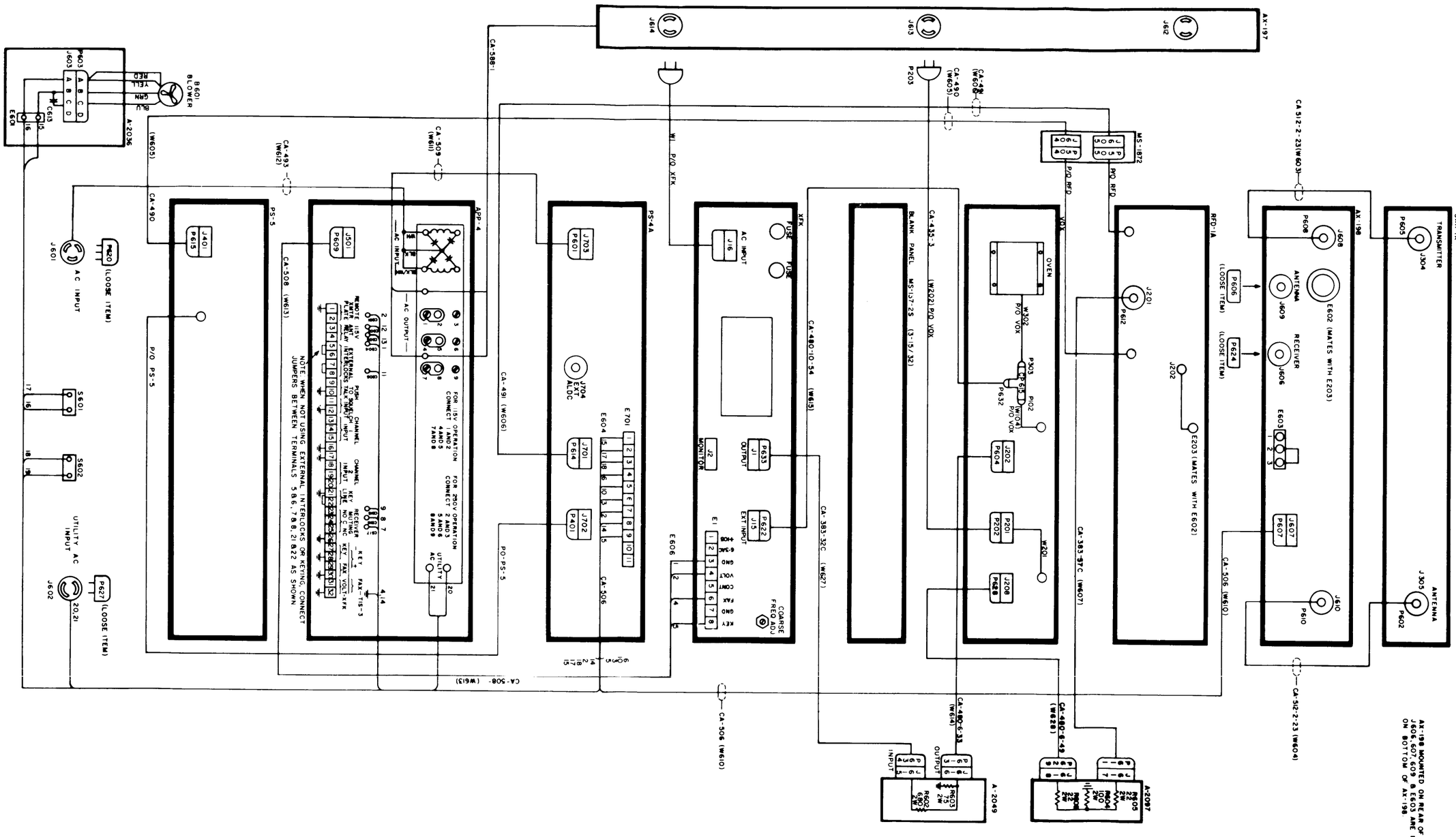


Figure 1-5. Wiring Diagram, SBT-1K(C)

greater detail in Section 3, the primary function of this circuitry is to disable the receiver in a given sequence of operations when the PAL-1KA is turned on and vice-versa to disable the transmitter in a given sequence of operations when the associated receiver is enabled. It is important when a transmitter is enabled or disabled that the associated receiver does not receive harmful voltages.

Figure 1-5 is the wiring diagram of the SBT-1K(S) in Rack RAK-9.

Figures 1-6 and 1-7 are installation diagrams of SBT-1K(C)'s RAK-9C.

1-3. Power Requirements

115 volts, 50 or 60 cycles approximately 3 KW.

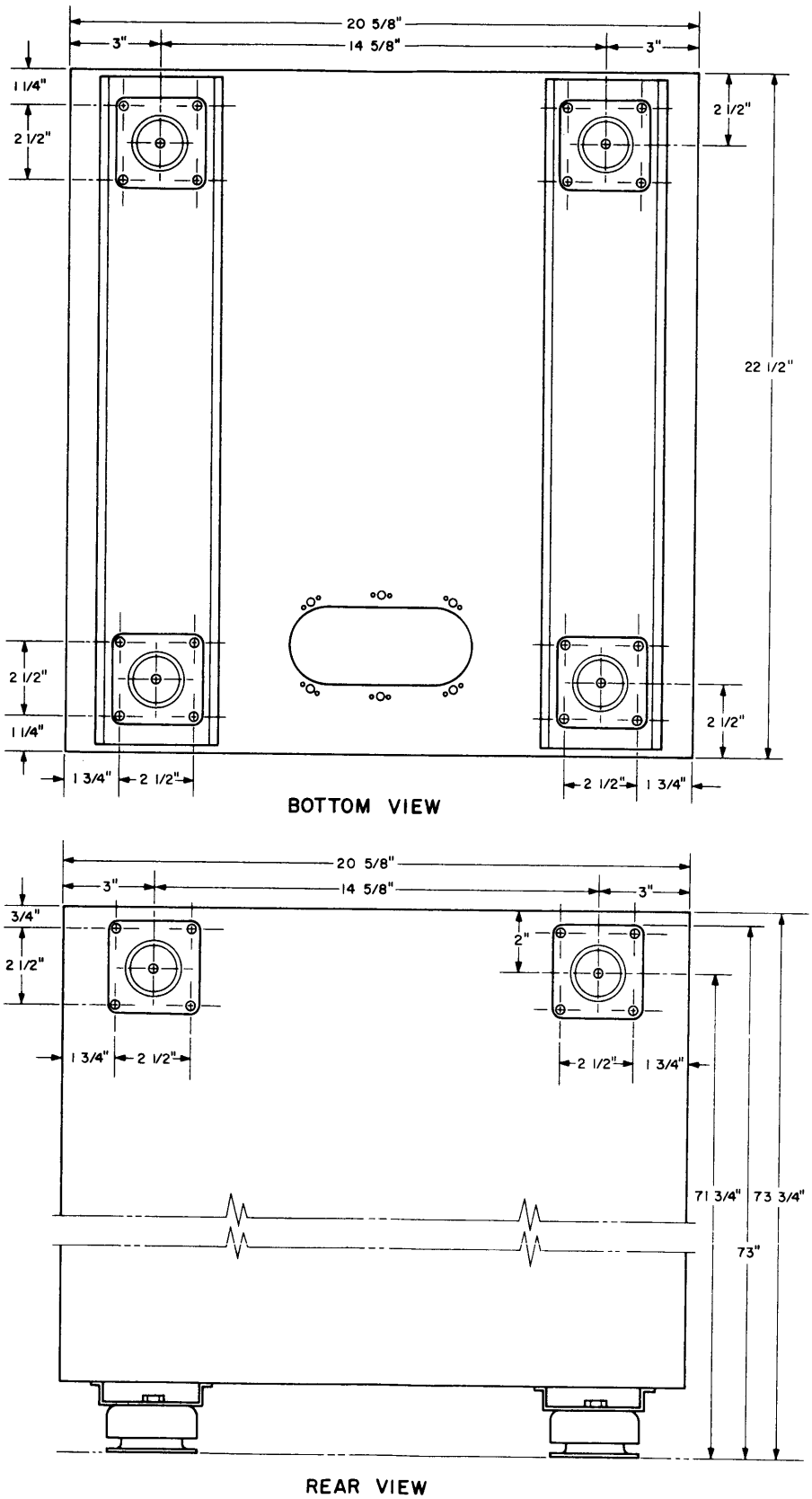
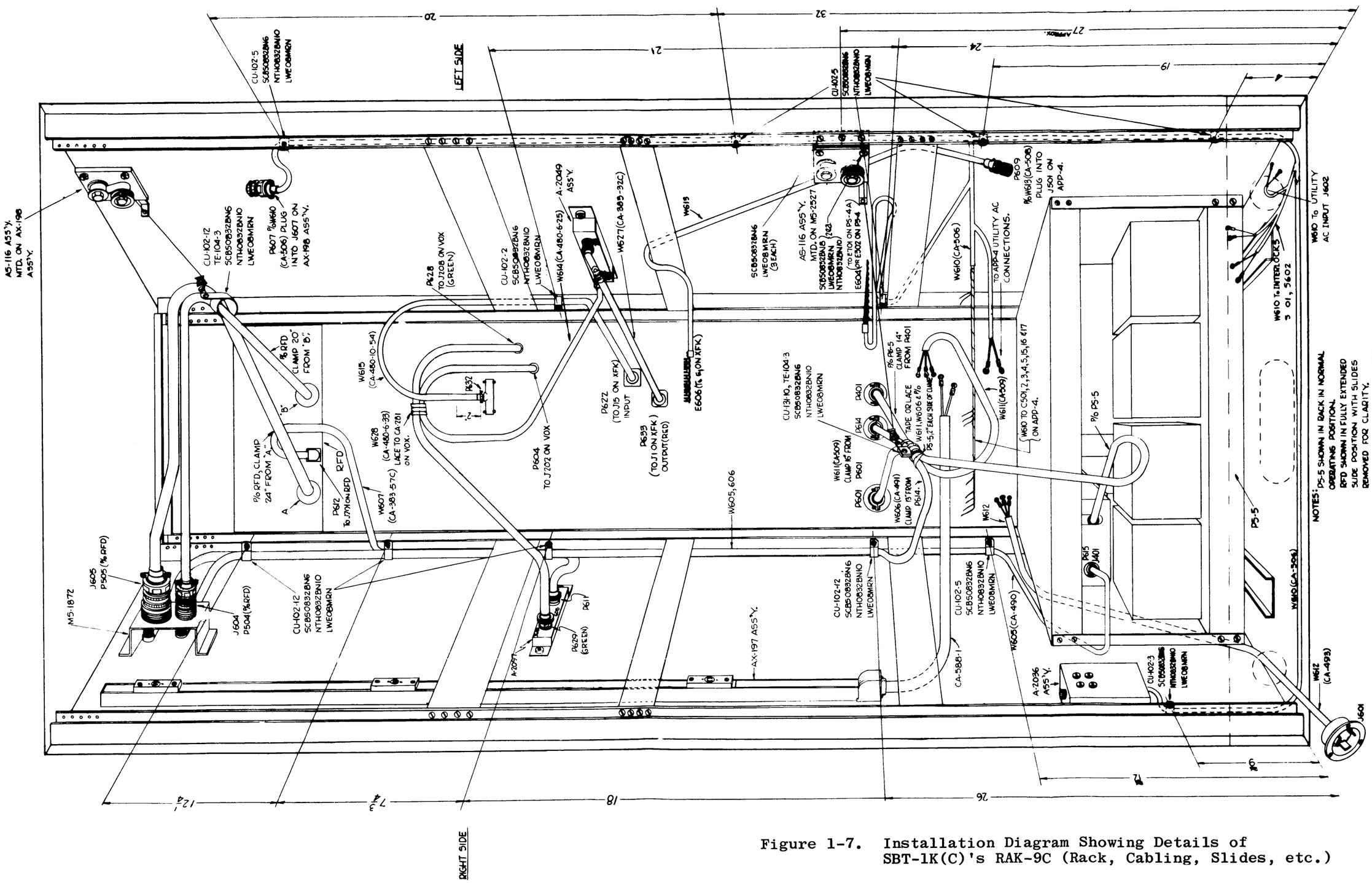


Figure 1-6. Dimensioned Installation View of SBT-1K(C), Shock Mounted



NOTES:
1. PS-5 SHOWN IN BACK IN NORMAL OPERATING POSITION.
2. RFD SHOWN IN FULLY EXTENDED SLIDE POSITION WITH SLIDES REMOVED FOR CLARITY.
3. ALL MEASUREMENTS TO CLAMPS ARE APPROX. WITH REFERENCE TO NEAREST MTG. HOLE.

Figure 1-7. Installation Diagram Showing Details of SBT-1K(C)'s RAK-9C (Rack, Cabling, Slides, etc.)

Section 2 - OPERATING INSTRUCTIONS

2-1. General

There are numerous equally good procedures to "turn on" the SBT-1K(C) and each individual operator will undoubtedly have his own preferred method. In section 3 of each detailed manual (SWR-1K, PAL-1KA, VOX-5, and XFK) there is a complete turn-on procedure which presents reasons for each operation. Accordingly the turn-on procedure given below is an abridged procedure, simulating a system check-off list.

2-2. Recommended Turn-On Chart

Figure 2-1 is a block diagram showing system operation and presenting means of setting frequency controls to obtain the desired antenna emission. It will be noted that the VOX is used twice: first, VOX's 2-4 mc oscillator is used to supply XFK's mixer with frequency in the 2-4 mc range; second, XFK's output, whose frequency is $f_{vox} + 0.200 \pm \frac{shift}{n}$ is multiplied in VOX's multiplier stages to

$$n \quad f_{vox} + 0.200 \pm \frac{shift}{n} \quad \text{where}$$

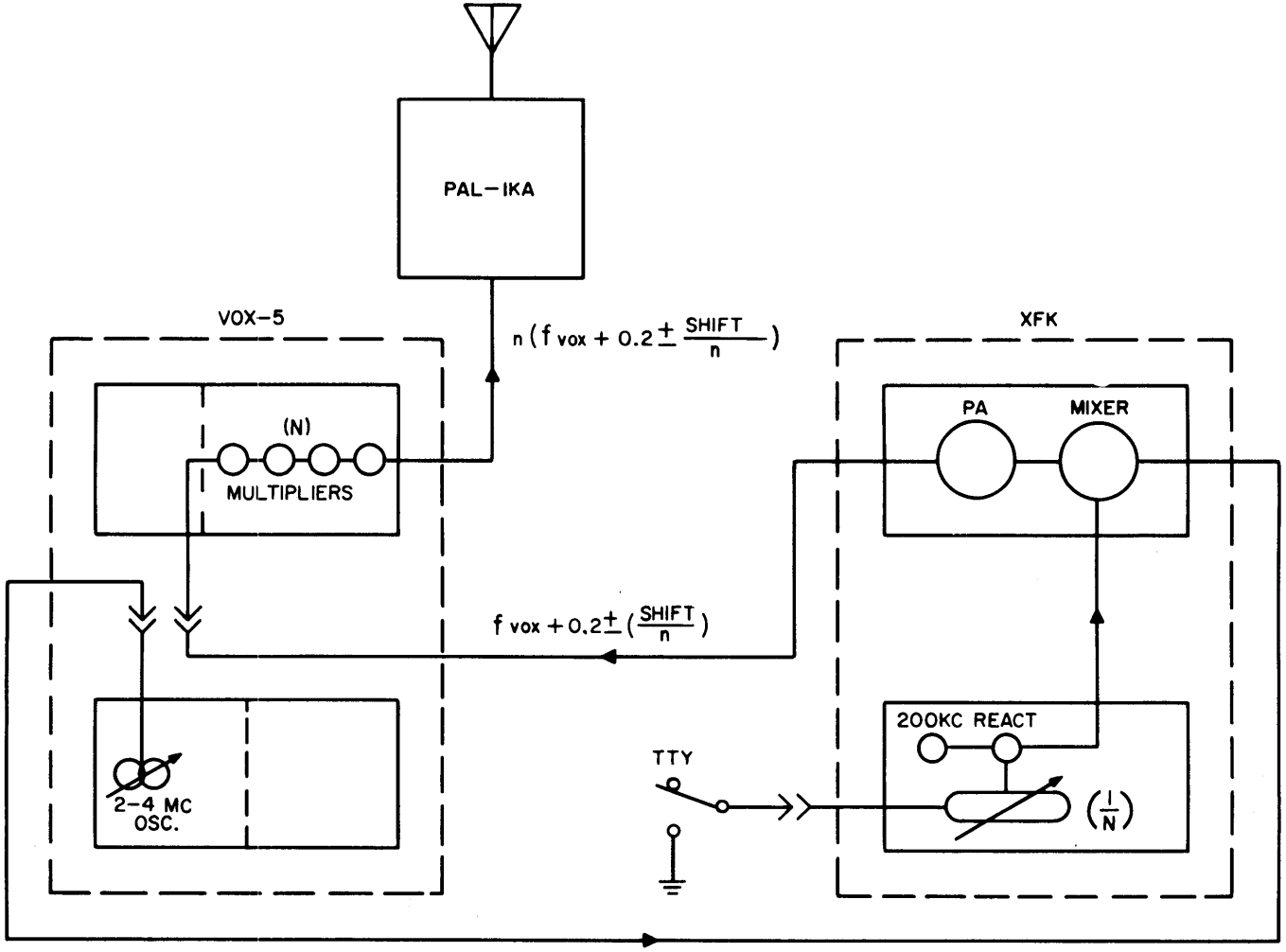
f_{vox} represents VOX's 2-4 mc oscillator frequency

0.200 represents XFK's 200 kc oscillator frequency

shift represents XFK's reactance tube frequency shift

n represents XFK's multiplier preset ratio

The example shows that for an antenna emission of 11.250 $\pm$ 425 cycles: f_{vox} equals 2.6125 mc and n equals 4.



EXAMPLE: OUTPUT 11.250 MC ± 425 CYCLES.

(1) f_{vox} MUST BE IN RANGE 2–4 MC

(2) $n\left(f_{vox} + 0.2 \pm \frac{SHIFT}{n}\right) = 11.250$

$$f_{vox} + 0.2 = \frac{11.250 \pm SHIFT}{n} = \frac{11.250}{n}$$

(3) HENCE $n = 4$ AND $f_{vox} = 2.8125 - 0.2 = 2.6125$ MC

Figure 2-1. Frequency Computation Chart for SBT-1K(C)

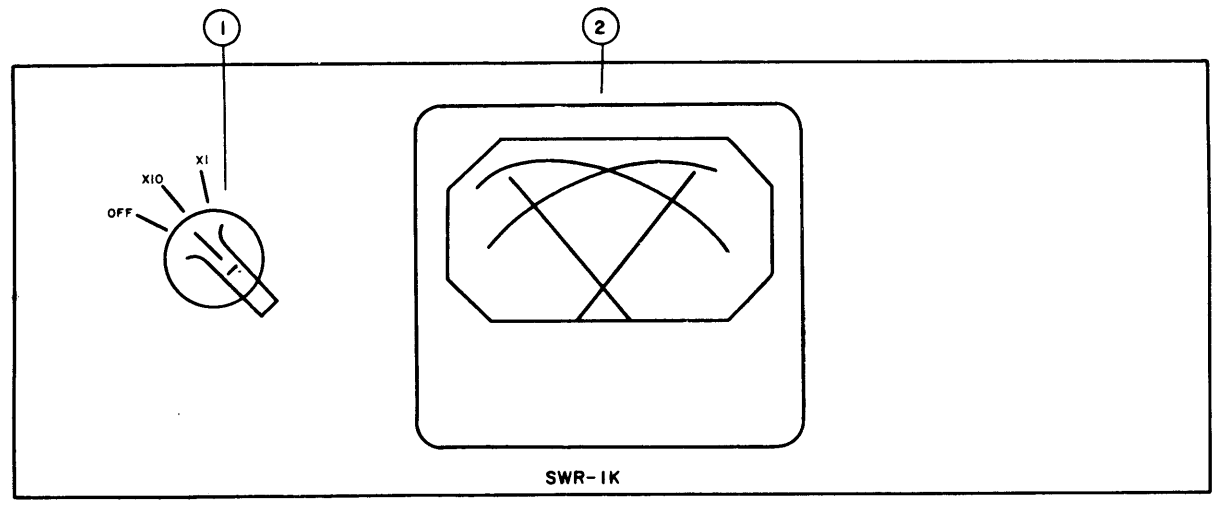
GENERAL PURPOSE TRANSMITTER MODEL SBT-1K(C), FRONT PANEL CONTROLS, OPERATING CHART

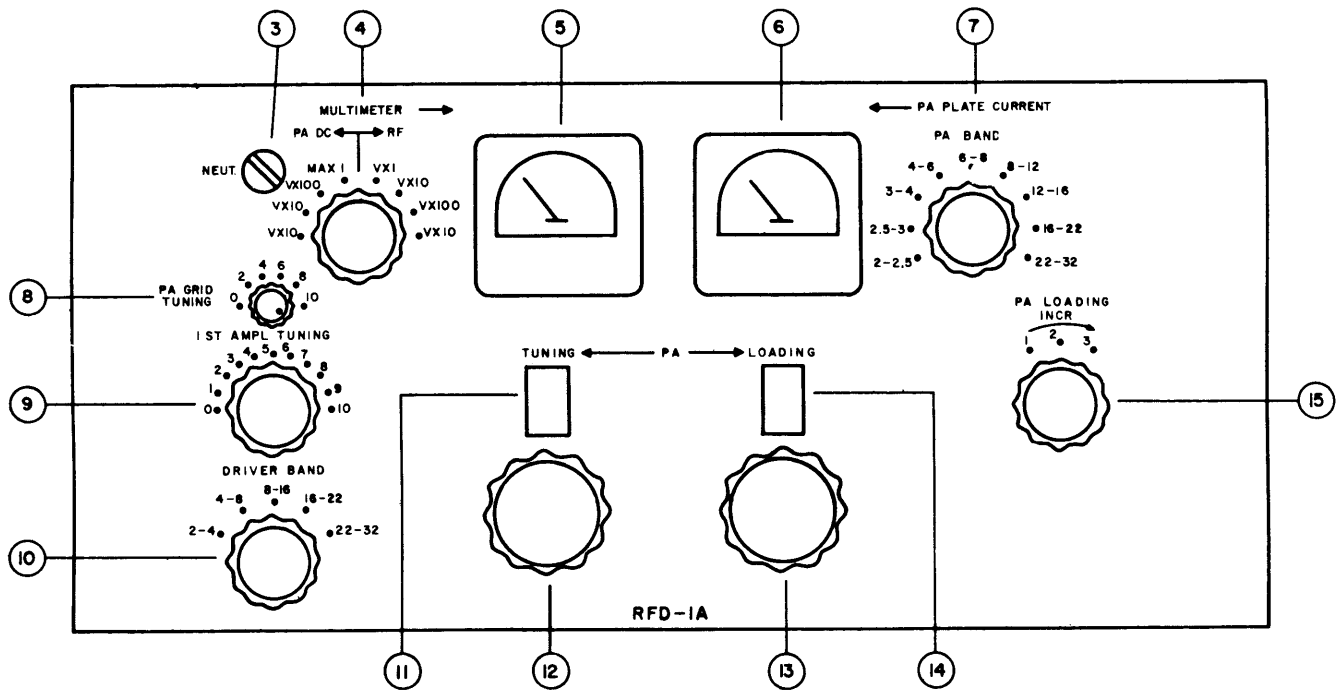
STEP	CONTROLS	OPERATIONAL DETAILS
1	See Para. 2-2	Compute VOX's medium frequency setting and XFK's multiplier preset ratio and set VOX's and XFK's controls accordingly.
2	See Section 3 of VOX-5 manual; 59, 60, 29	Calibrate VOX-5. This will require rack power; MAIN BREAKER 59 of APP-4 unit must be in ON position; MAIN POWER indicator 60 must be lit. With VOX's MASTER FREQUENCY OSCILLATOR control 29 on desired VOX's computed medium frequency, the VOX is supplying the desired computed medium frequency to the XFK.
3(a)	Section 3 of XFK manual; 38, 39, 40, 41	Set POWER ON-OFF switch 41 to ON position. POWER indicator 39 and 200 kc OVEN indicator 38 should light. Allow sufficient warm-up time.
(b)	36, 37, 44	Set PLATE ON-OFF switch 37 to ON position and turn POWER control 44 to limit PA plate current 36 to 50 ma.
(c)	45	Set XTAL selector switch 45 to EXT.
(d)	47	Set BAND CHANGE switch 47 to 1 for VOX's medium frequency in 2 to 2.5 mc range and to 2 for VOX's medium frequency in 2.5 to 4.0 mc range.
(e)	36, 48, 44	Set OUTPUT TUNING MC control 48 so that its dial shows the correct VOX's medium frequency. PA PLATE CURRENT meter 36 reading should be set at 50 ma. Only a slight readjustment of OUTPUT TUNING MC control 48 should now be required to cause PA PLATE CURRENT meter 36 current to dip.
(f)	44, 36	Adjust POWER control 44 until meter 36 indicates 50 ma. Make certain not to increase PA PLATE CURRENT (36) over 50 ma.

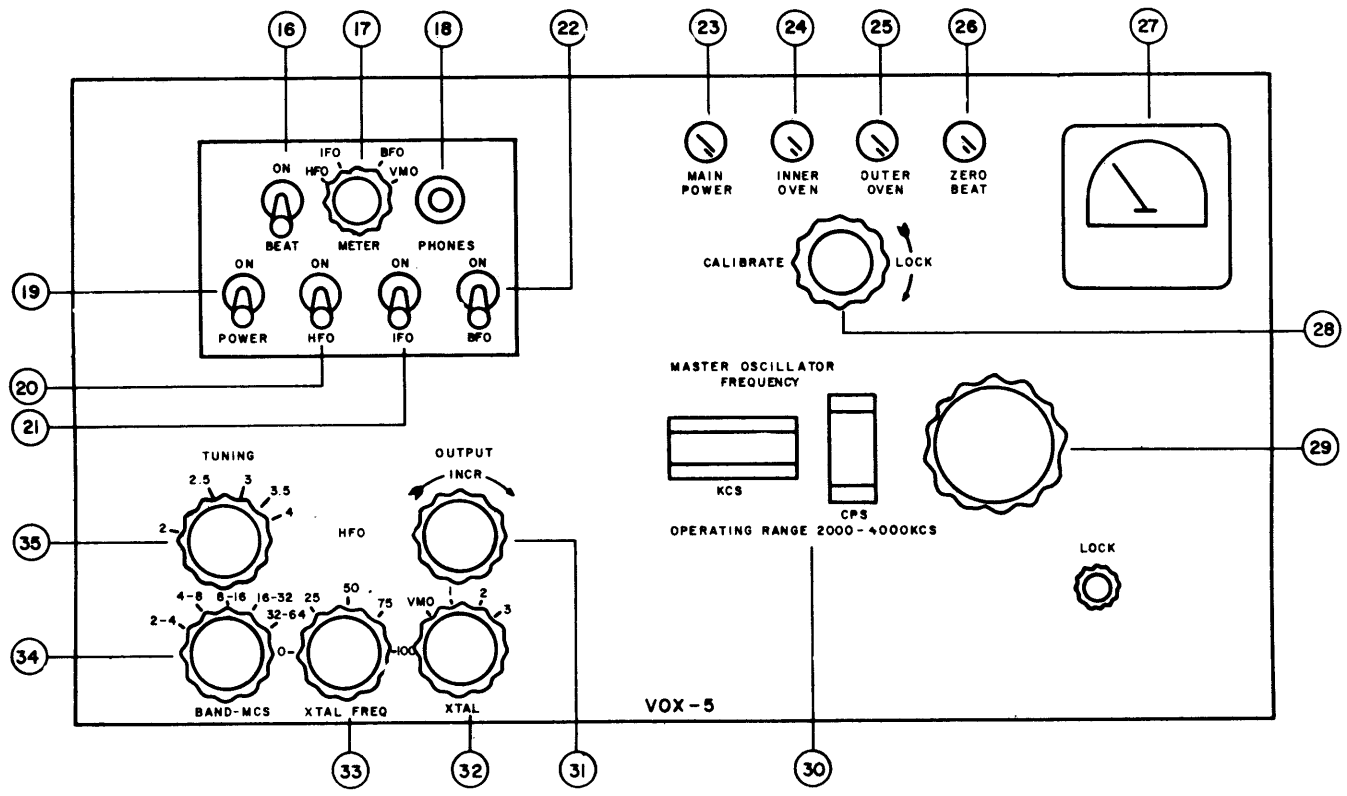
STEP	CONTROLS	OPERATIONAL DETAILS
(g)	42	Set FREQUENCY SHIFT CPS control 42 to the desired shift of the associated transmitter. No allowance for frequency multiplication need be made if the patch panel at the rear of the chassis has been properly connected.
(h)	43	Turn TEST selector switch 43 to LINE. The XFK is now ready to operate on keyed signals.
(i)	46	Turn FREQUENCY control 46 to 0; the unit will now be on frequency within ± 50 cps.
4	19, 20, 17, 32, 34, 29, 31, 35, 27	POWER 19 ON; HFO 20 ON; METER 17 to HFO; XTAL 32 to VMO; BAND MCS 34 to desired VOX's output frequency; OUTPUT 31 to midrange; TUNING 35 to maximize meter 27 reading.
5	1, 31, 27	Before turning on the PAL-1KA, check that its output is properly terminated, that control 1 is in the OFF position, and that VOX's output meter 27 is midscale.
6(a)	10, 7	Set DRIVER BAND 10 and PA BAND 7 to desired PAL-1K's output frequency.
(b)	52, 51, 54, 53, 55, 56, 49	The PAL-1KA should be turned on under the following initial conditions: Output of all PS-4A voltages normal. Check that MAIN POWER circuit breaker 52 is in the ON position; that MAIN POWER indicator 51 is lit; that TRANSMITTER VOLTAGES switch 54 is in STANDBY and its indicator 53 is not lit; that FINAL VOLTAGES switch 55 is OFF and its indicator 56 is not lit. PA FIL PRI meter 49 should read 115 volts. Under these conditions the PAL-1KA may be turned on by setting TRANSMITTER VOLTAGE switch 54 to ON (indicator 55 now lights).

STEP	CONTROLS	OPERATIONAL DETAILS
(c)	4, 9	Turn the MULTIMETER switch 4 to the 1st AMPL position. Adjust VOX's output 31 until a usable reading is obtained on MULTIMETER 5. Rotate 1st AMPL TUNING 9 to maximize reading on MULTIMETER 5.
(d)	4, 8	Turn the MULTIMETER switch 4 to the PA Eg position. Adjust VOX's output 31 until a usable reading is obtained on MULTIMETER 5. Rotate PA GRID TUNING 8 to maximize reading on MULTIMETER 5. CAUTION Reduce VOX output 31 if PA OVERLOAD 57, 58 kicks off.
(e)	31	Turn VOX's OUTPUT 31 fully CCW (temporarily).
(f)	12	Turn PA TUNING switch 12 for desired output frequency (see tuning chart).
(g)	15	Turn PA LOADING switch 15 for desired output frequency (see tuning chart).
(h)	13	Turn PA LOADING knob 13 for desired output frequency (see tuning chart).
(i)	56, 55	Turn FINAL VOLTAGES switch 56 to ON; indicator 55 should light.
(j)	31, 6	Increase VOX's output 31 until PA PLATE CURRENT 6 meter indicates 300 ma.
(k)	31	Increase VOX's OUTPUT 31 sufficiently to carry out following PA tuning and loading operations. Turn on control 1 to X10 so that SWR-1K can monitor PAL-1KA's output to antenna.
(l)	12, 6	Adjust PA TUNING switch 12 observing the PA PLATE CURRENT meter 15 for a dip.

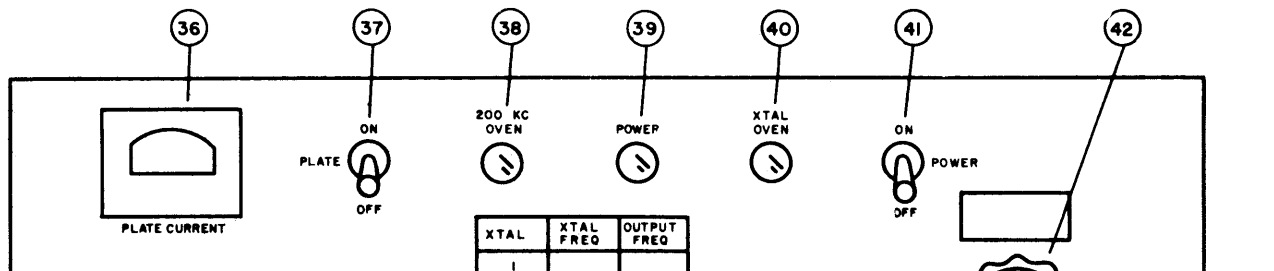
STEP	CONTROLS	OPERATIONAL DETAILS
(m)	13, 6	Increase PA LOADING switch 13 until the plate current rises.
(n)	31, 6	Readjust VOX's OUTPUT 31 until PA PLATE CURRENT meter 6 indicates 300 ma.
(o)	12, 6	Adjust PA TUNING switch 12 observing the PA PLATE CURRENT meter 15 for a dip.
(p)	12, 13, 6, 31	Repeat PA TUNING and PA LOADING adjustments until the desired power output (1000 watts on SWR-1K) is reached with minimum output on VOX as indicated on RFD-1A's MULTIMETER 5 with switch 4 in PA Eg. Observe VOX's RF output on meter 27. The screen current on RFD-1A's MULTIMETER 5 with switch 4 in PA Isg is (with a resistance load) usually less than 15 ma. At no time should the screen current reading exceed 50 ma. If screen current is too high, increase load and readjust PA TUNING for a dip. CAUTION Equal magnitudes of reflected and forward watts indicates trouble. Antenna termination should be checked. Proper PAL-1KA's tuning and loading should show: forward watts, approximately 1000 reflected watts, approximately 50* dip indication on tuning meter screen grid current, less than 50 ma plate current, approximately 650 ma * Antenna system should be such as to minimize reflected watts to a value such that the VSWR is 1.5 or less.


1
2
XI0
XI
OFF
SWR-1K


3
4
5
6
7
MULTIMETER
PA DC
RF
NEUT.
MAX
VXI
VXIOO
VXIO
VXIO
VXIOO
VXIO
VXIO
PA PLATE CURRENT
PA BAND
4-6
6-8
8-12
3-4
12-16
2.5-3
16-22
2-2.5
22-32
8
PA GRID TUNING
1ST AMPL TUNING
PA LOADING INCR
9
10
15
DRIVER BAND
4-8
8-16
16-22
2-4
22-32
TUNING
PA
LOADING
RFD-1A
11
12
13
14


16
17
18
22
23
24
25
26
27
ON
IFO
HFO
BFO
VMO
BEAT
METER
PHONES
MAIN POWER
INNER OVEN
OUTER OVEN
ZERO BEAT
CALIBRATE
LOCK
19
POWER
HFO
IFO
BFO
28
20
21
MASTER OSCILLATOR FREQUENCY
KCS
CPS
OPERATING RANGE 2000-4000KCS
29
TUNING
OUTPUT INCR
35
HFO
LOCK
4-8
8-16
16-32
25
50
75
VMO
2-4
32-64
0-100
34
BAND-MCS
XTAL FREQ
XTAL
VOX-5
33
32
31
30

BLANK PANEL


36
37
38
39
40
41
42
PLATE CURRENT
ON
PLATE
OFF
200 KC OVEN
POWER
XTAL OVEN
ON
POWER
OFF
XTAL
XTAL FREQ
OUTPUT FREQ

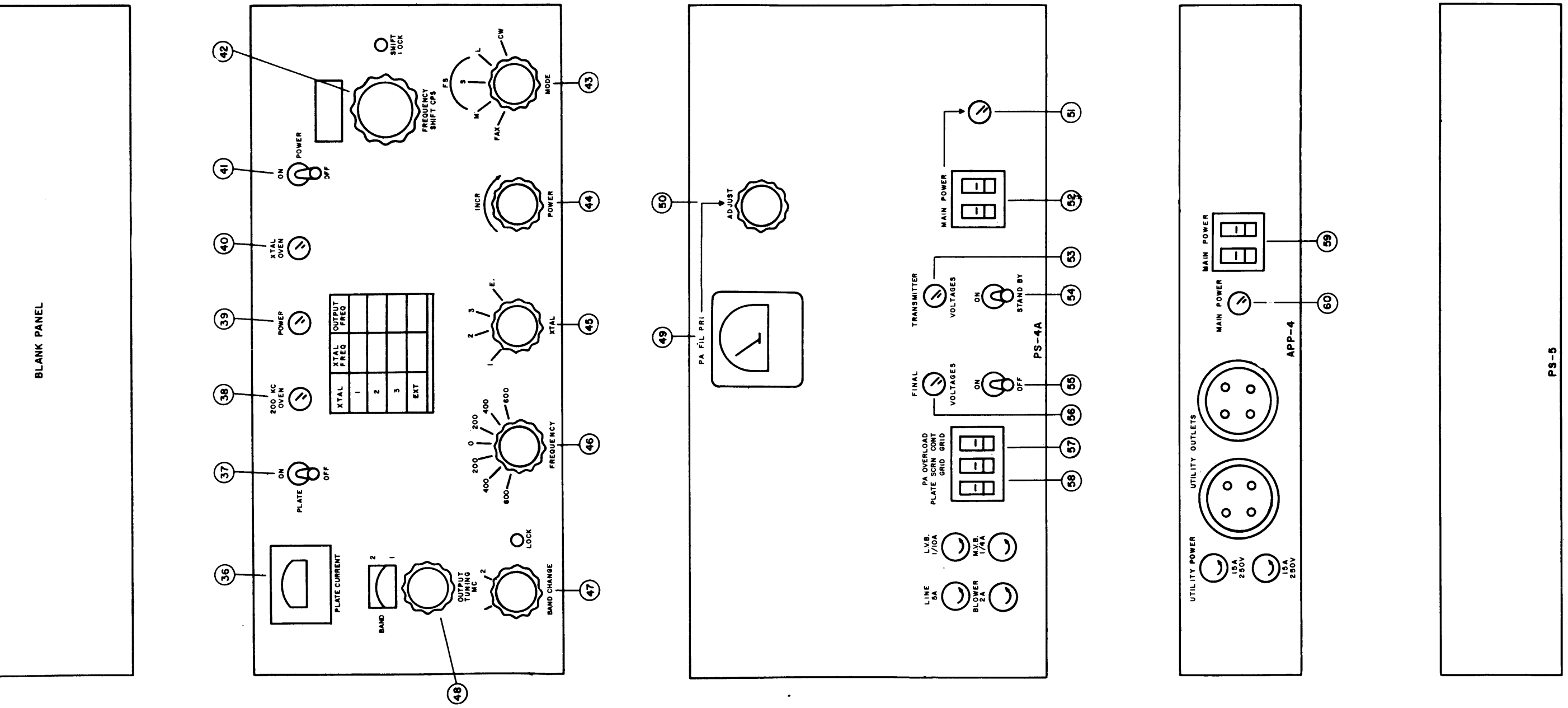


Figure 2-2. Front Panel Controls, SBT-1K(C)

Section 3 - OPERATING THEORY OF AX-198 ASSEMBLY

The primary functions of the AX-198 are to provide antenna switching for (1) transmitter enabling and receiver disabling and (2) vice-versa; in a sequential operational order; to insure protection of equipment units against the hazard of excessive voltages, transient or steady state. As shown in figure 1-3, the AX-198 is mounted in the rear of RAK-9, directly behind the RFD-1A and SWR-1K. Interconnection of the AX-198 within the transmitter system is shown in figures 1-4 and 1-5.

3-1. Circuit Operation in Switching from Receiver Operation to Transmitter Operation (figure 3-1).

Figure 3-1 is an operational schematic to illustrate AX-198's performance as above stated. The purpose of this figure is to present a concrete operational picture of the inter-relation of PS-4A, PS-5, RFD-1A and APP-4 control functions, divorced from the many other functions of these equipment units. In other words, other drawings in this manual show complete schematics of these units; however, figure 3-1 shows only the pertinent circuitry to explain the details in paragraphs 3-1, 3-2 and 3-3, below.

Assumptions, as given below, are necessary in order that a logical circuit operation may be presented.

a. The operator is familar with the operation of the SBT-1K system.

b. The SBT-1K system is functioning correctly; the transmitter has been operating at full power and has just been returned to a "non-transmitting" or "receiver" condition by setting S702 on the PS-4A from ON to the STANDBY position. Figure 3-1 illustrates the control circuits involved for returning the transmitter to the

"ON" position. All relays and switches shown on this drawing are in the proper position for the "receiver" condition.

c. PS-4A must be functioning and yielding nominal output voltages:

(i) +500VDC at terminal 9, E701.

(ii) -200VDC at the coil of K703.

(iii) PA bias voltage at pin C (J701) of PS-4A applied to the PA in the RFD-1A through P614, J605 and P505.

(iv) No voltage between terminals 5 and 6 (E701) on the PS-4A and thus none applied to the coil of K602 in the AX-198 through E604, P607 on the AX-198. K602 is therefore de-energized.

(v) K601 in the AX-198 is also de-energized.

NOTE: +500VDC is applied to the coil through E701, E604, P607, J607, the rack main cable but the relay will not be energized because its coil voltage circuit is NOT completed to ground through the normally closed contact of K602; pin E of J607/P607; the rack main cable; E604; and E701 on the PS-4A.

(vi) The receiver (if used) is connected to the antenna through a normally closed contact of K601; J608; through the SWR-1K;V610, W601; J609 and P616.

(vii) K703 in the PS-4A is de-energized. The -200v applied will not cause K703 to energize because the coil voltage circuit is NOT completed through the interlock circuit to ground. The interlock circuit is open at K601.

(viii) As a result of K703 being de-energized, there will be no B+ voltages applied to the RFD-1A.

Let us now change the system from the "receiver" to the "transmitter" condition:

a. Set S702 on the PS-4A to the "ON" position.

b. As an second alternate, jumper terminals 1 and 2 on the APP-4.

By performing either a or b, terminal 4 of E701 on the PS-4A is grounded with the following results:

a. K601 in the AX-198 will energize as its coil circuit will be completed to ground through K602, J607, E604, E701 (terminal 4) on the PS-4A.

b. As a result of item a, the RF output of the RFD-1A is connected to the antenna through K601, J608, SWR-1K, J610, W610, J609 and P606.

c. As a result of item a, the interlock circuit is completed to ground through K601, a normally closed contact of K602 to pin G of J607, the rack main cable, terminal 8 of E701 on the PS-4A. K703 in the PS-4A will now energize since the interlock circuit is closed.

d. Primary voltage will now be applied through K703 to the HV transformer in the PS-5 (via J/M of P401) and plate voltage will be applied to RFD-1A's PA through J401, P615 J604, and P504. At the same time, B+ voltages will be applied to the RFD-1A through pins d, e and B on P505, J605, P614, and J701 on the PS-4A.

e. Now, 115VAC appears across terminals 5/6 on E701 in the PS-4A and hence across the coil of K602 through E604, the rack main cable, P607 and J607 on the AX-198. K602 is now energized and transfers its controls to K601.

f. As a result of item e, transferring the control of the interlock circuit, and also of K703, finalizes action in previous items a through d. Completion of the coil voltage circuit to K601 is transferred from pin 4 E701 directly to ground through pin G of J607.

NOTE: Sequential switching was used to insure that the antenna being connected to the RFD-1A RF output before high voltage was applied. This sequency will be more evident when returning to the "receiver" condition. The transmitter is now switched to the "transmit" condition and the receiver is now disabled (pins 23, 24, and/or 25 on the APP-4).

3-2. Circuit Operation in Switching from Transmitter Operation to Receiver Operation (figure 3-1).

NOTE: Opening the interlock circuit will cause the systems to return to the "receiver" condition. This is done normally by setting S702 on the PS-4A to STANDBY. Alternatively, setting S104 on the SBE-3 to OFF; or opening terminals 1 and 2 or 9 and 10 on the APP-4. See preceding paragraph 3-1, for method of turning transmitter ON. Terminal 4 of E701 on PS-4A is now no longer at ground and the following sequences will occur.

a. Sequentially, K703 in the PS-4A is de-energized because its coil voltage circuit is no longer completed to ground.

b. As a result of item a (K703 being de-energized) all B+ voltage is removed from the RFD-1A and the coil voltage is removed from K602 in the AX-198.

> NOTE: K601 is still energized because its coil voltage circuit is completed directly to ground through pin G of J607. The B+ voltages have therefore been removed from the RFD-1A but the antenna connector E203 is still connected to the antenna.

c. Sequentially, K602 is de-energized which returns control to K601 (terminal 4, E701 on PS-4A).

d. Since terminal 4 of E701 is no longer grounded, K601 is de-energized and its coil voltage circuit is no longer complete.

e. The system is now returned to the conditions described above as Receiver.

3-3. SBT-1K(S) Interlock Circuits

See figure 3-1.

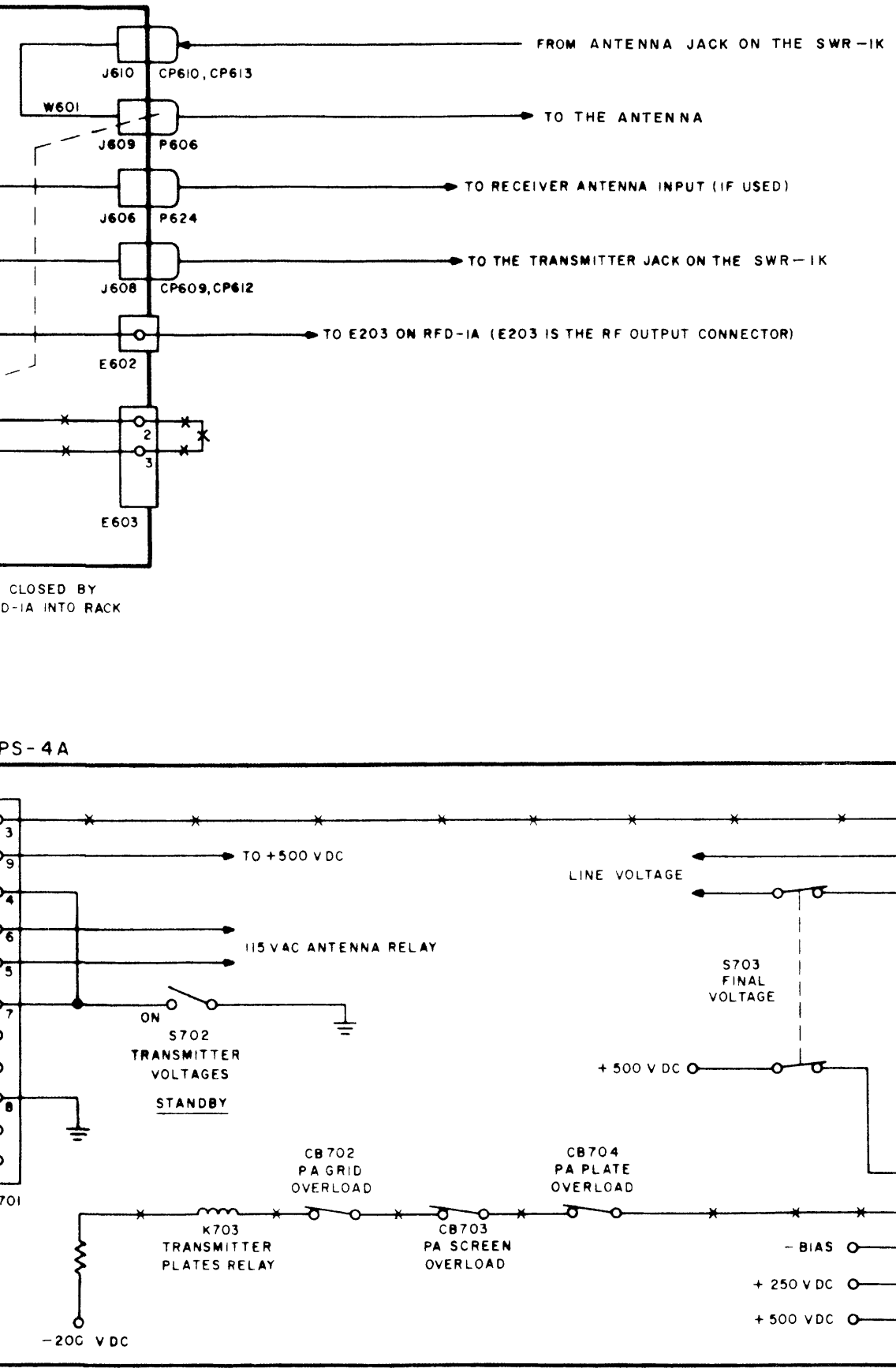
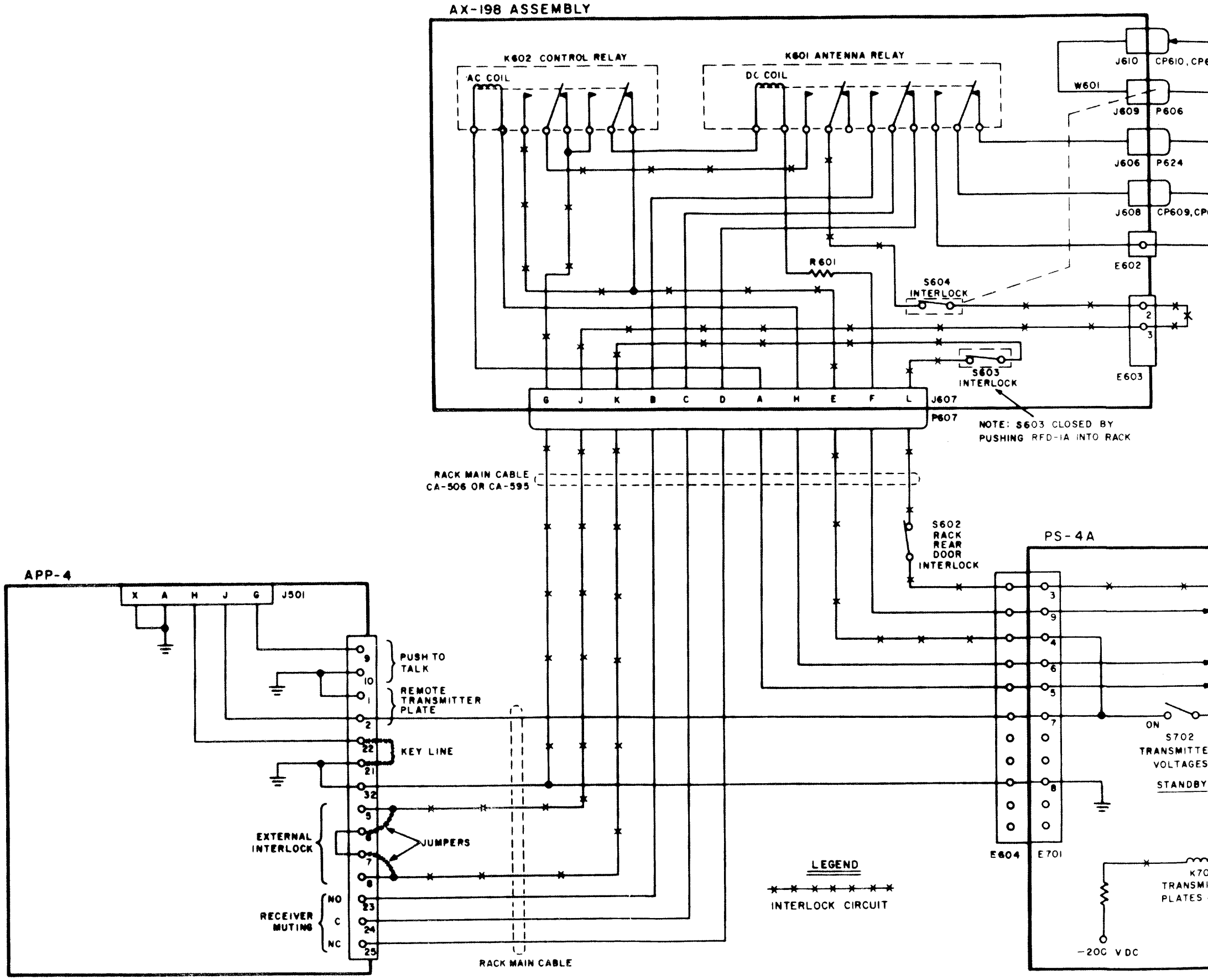


Figure 3-1. Operational Schematic Illustrating AX-198 Assembly Functions as used in SBT-1K Transmitters


AX-198 ASSEMBLY
K602 CONTROL RELAY
AC COIL
K601 ANTENNA RELAY
DC COIL
J610
CP610, CP6
W601
J609
P606
J606
P624
J608
CP609, CP6
E602
R601
S604
INTERLOCK
2
3
S603
INTERLOCK
E603
G J K B C D A H E F L
J607
P607
NOTE: S603 CLOSED BY
PUSHING RFD-1A INTO RACK
RACK MAIN CABLE
CA-506 OR CA-595
S602
RACK
REAR
DOOR
INTERLOCK
PS-4A
APP-4
X A H J G
J501
9
10
1
2
22
21
32
5
6
7
8
23
24
25
PUSH TO
TALK
REMOTE
TRANSMITTER
PLATE
KEY LINE
EXTERNAL
INTERLOCK
JUMPERS
RECEIVER
MUTING
NO
C
NC
RACK MAIN CABLE
3
9
4
6
5
7
8
ON
S702
TRANSMITTE
VOLTAGES
STANDBY
E604
E701
LEGEND
INTERLOCK CIRCUIT
K70
TRANSMI
PLATES
-200 V DC

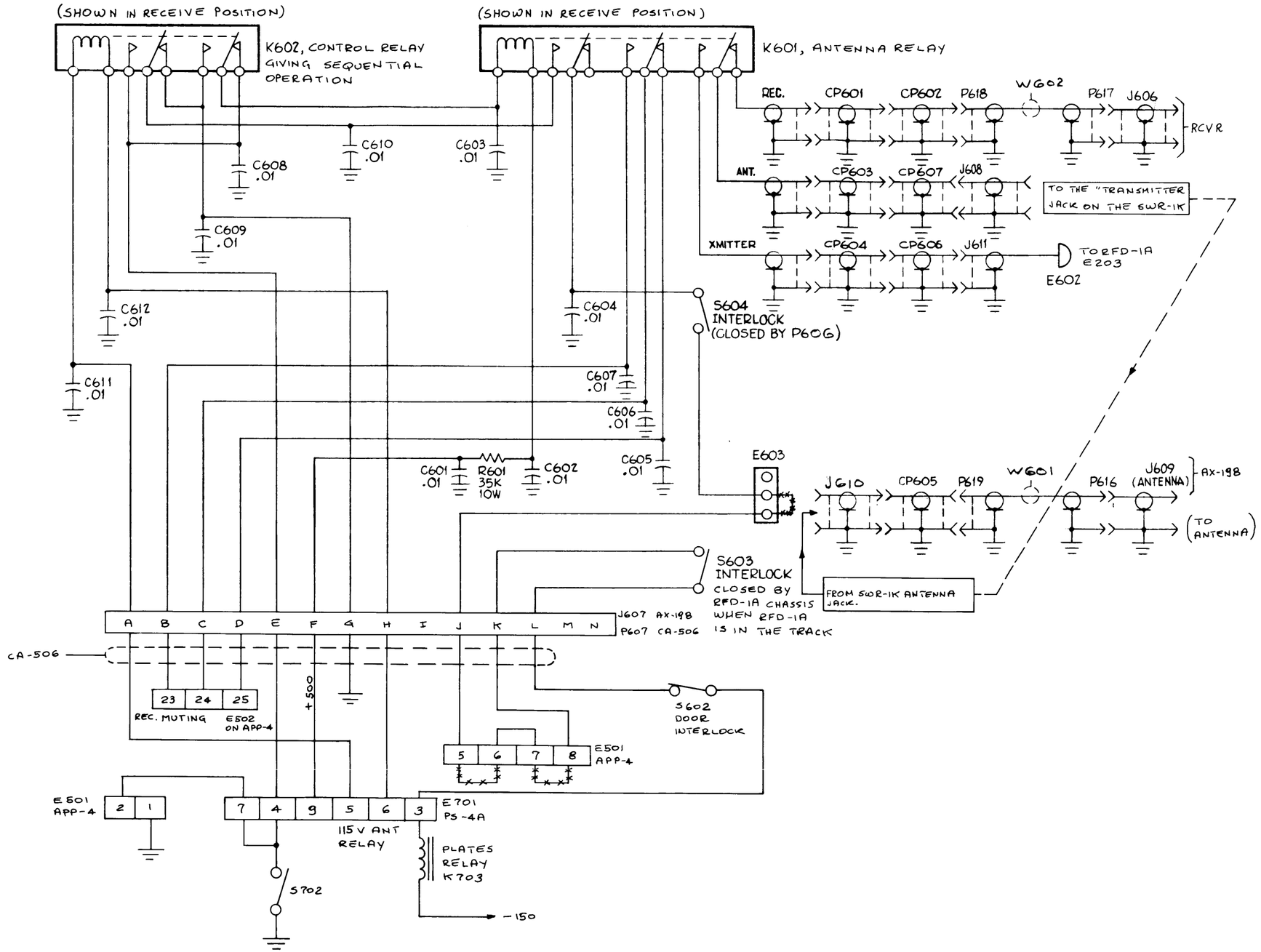
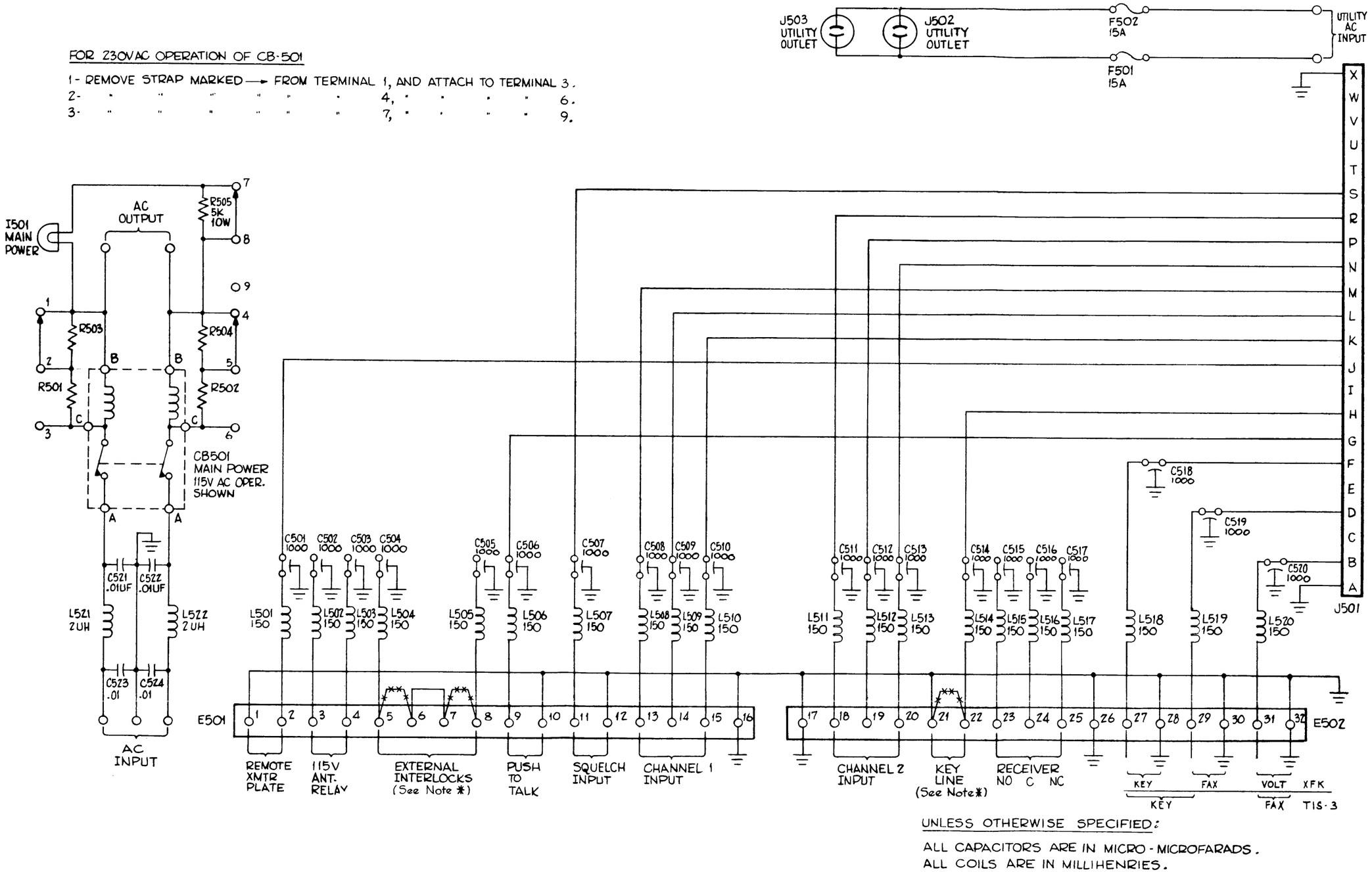


Figure 3-2. Schematic Diagram of AX-198 Assembly

FOR 230VAC OPERATION OF CB-501

1- REMOVE STRAP MARKED ⟶ FROM TERMINAL 1, AND ATTACH TO TERMINAL 3.
2- " " " " " " 4, " " " " 6.
3- " " " " " " 7, " " " " 9.



UNLESS OTHERWISE SPECIFIED:

ALL CAPACITORS ARE IN MICRO-MICROFARADS.
ALL COILS ARE IN MILLIHENRIES.

Figure 3-3. Schematic Diagram of APP-4