Regency® COMMUNICATIONS, INC.

SERVICE MANUAL

DC POWER SUPPLIES

MODEL

BPS-20 LH
PS-1422
PSC-1422

1227 S. PATRICK DR.
SATELLITE BEACH, FL. 32937

7001-4031-200

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8/82

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SECTION I - D.C. POWER SUPPLIES

A. Regulated Power Supply Circuit Description

The power supply transformer TI transforms the 117 VAC line voltage to 20 VAC at the secondary. This is applied to a full wave bridge rectifier CR1 and filter capacitors C5 and C6 to produce approximately 25 VDC which is reduced to 13.6 VDC and current limited to 23.5 amps by the pass transistors Q1, Q103 and Q104.

The regulator circuitry operates as follows:

R108, R109, R110, R111 and R112 divide the output voltage down to supply feedback to the input of IC101 (pin 6). Potentiometer R110 allows adjustment of the output voltage from 12.5 to 15 VDC. R106 and R107 forms a voltage divider to supply current limit reference voltage to IC101 (pin 1). This is fixed at 23.5 amps. The output of IC101 (pin 2) drives transistors Q101 and Q102. The emitter of Q102 drives the three pass transistors Q1, Q103 and Q104.

As an example, assume that the load increases the current drain on the pass regulators (Q1, Q103, Q104) causing the output voltage, and consequently the sense voltage, to drop slightly. This reduction of voltage on pin 6 of IC101 causes the booster output to also go low. This reduction of voltage on the base of Q101 causes an increase of conduction. This increases the collector voltage of Q101 and the base voltage of Q102. This increased voltage on the base of Q102 also causes an increase of conduction raising the voltage on the emitter. This increased emitter voltage supplies more drive to the bases of the pass regulators (Q1, Q103 and Q104). This increased drive causes the pass regulators to supply more current to the load and raises the output voltage.

B. Operation of DC Power Supplies on 230V or 50 Hz

1. For 230V operation, refer to schematic for wiring information.
2. For 50 Hz operation, order MA-152, factory installed or for field conversion.

Voltages

	Emitter	Base	Collector
Q1	13.6	14.1	25.8
Q101	25.8	25.2	14.6
Q102	14.1	14.6	25.8
Q103	13.6	14.1	25.8
Q104	13.6	14.1	25.8

C. Specifications

Input Voltage: 115 VAC or 230 VAC, 60 Hz Nominal
(115 VAC or 230 VAC, 50 Hz available, special order)

Input Voltage Range: 105 VAC to 130 VAC, 210 VAC to 260 VAC

Line & Load Regulation: Less than .2 VDC No Load Full Load

Ripple: Less than 25 MV (RMS) @ full load

Temperature Coefficient: Flat -30°C to 25°C, +.03%/°C 25°C to +60°C

Operating Temperature: -30°C to +60°C

Output Adjustment Range: 12.5 to 15.0 VDC

Output Voltage Setting: 14.0 VDC $\pm$.2V

Output Current Limit: 23.5 Amps

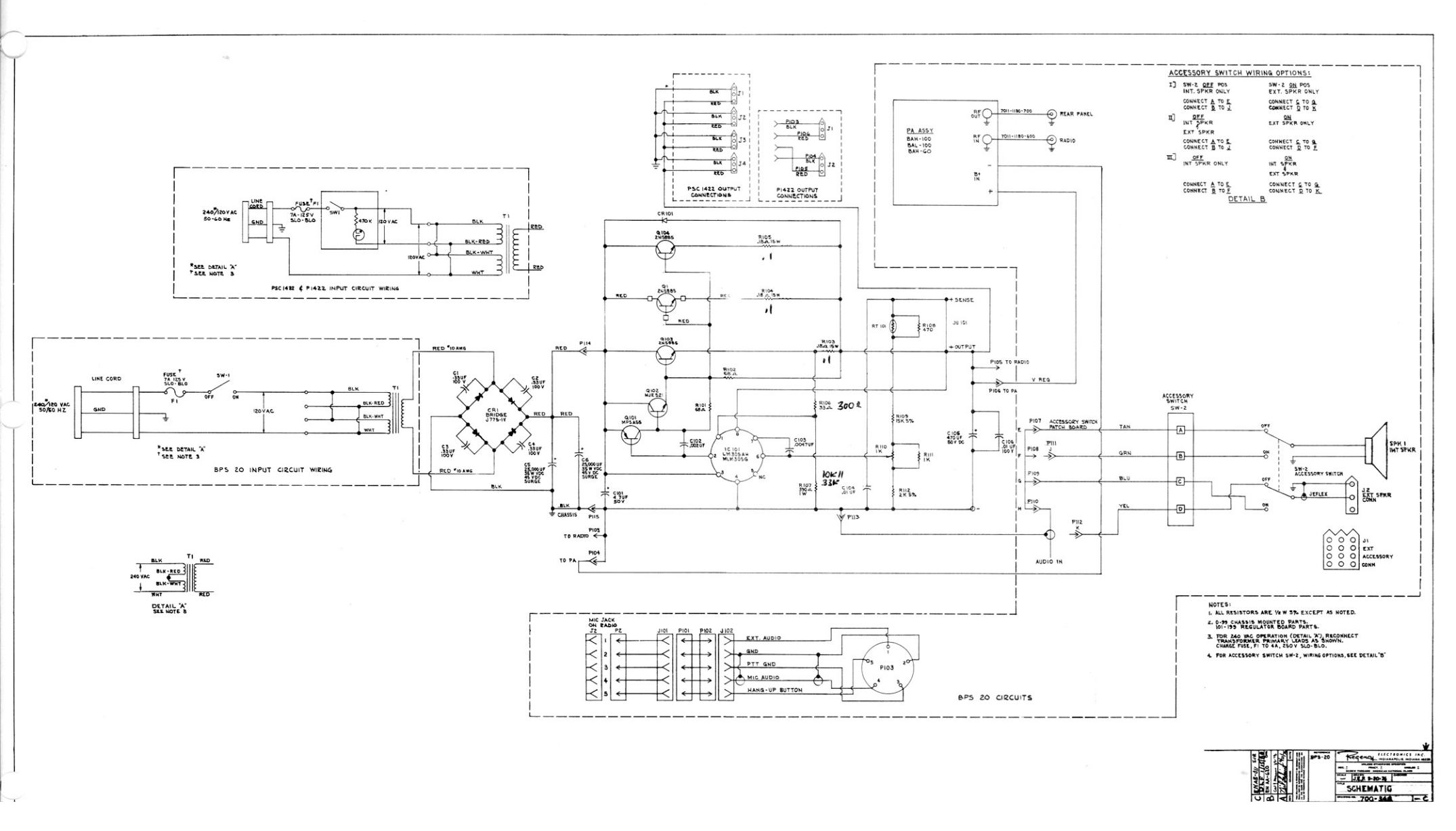
Short Circuit Current: 7.5 Amps Max.

Maximum Input Power: 600 watts (115 VAC)

Weight: 35 lbs. Max. (BPS-20), 22½ lbs. (PSC-1422)

Dimensions: 12"W x 8"H x 16½D (BPS-20), 19"W x 5¼"H x 10"D (PSC-1422)

Fuse Size: 7A 3AG 125V
4A 3AG 250V


ACCESSORY SWITCH WIRING OPTIONS:
I] SW-2 OFF POS INT. SPKR ONLY
CONNECT A TO E
CONNECT B TO J
SW-2 ON POS EXT. SPKR ONLY
CONNECT C TO G
CONNECT D TO K
II] OFF INT SPKR & EXT SPKR
CONNECT A TO E
CONNECT B TO J
ON EXT SPKR ONLY
CONNECT C TO G
CONNECT D TO K
III] OFF INT SPKR ONLY
CONNECT A TO E
CONNECT B TO J
ON INT SPKR & EXT SPKR
CONNECT C TO G
CONNECT D TO K
DETAIL B
PA ASSY BAH-100 BAL-100 BAH-60
REAR PANEL
RADIO
PSC1422 OUTPUT CONNECTIONS
P1422 OUTPUT CONNECTIONS
PSC1422 & P1422 INPUT CIRCUIT WIRING
BPS 20 INPUT CIRCUIT WIRING
DETAIL 'A' SEE NOTE B
ACCESSORY SWITCH SW-2
SPK 1 INT SPKR
J2 EXT SPKR CONN
J1 EXT ACCESSORY CONN
BPS 20 CIRCUITS
NOTES:
1. ALL RESISTORS ARE ½ W 5% EXCEPT AS NOTED.
2. 0-99 CHASSIS MOUNTED PARTS. 101-199 REGULATOR BOARD PARTS.
3. FOR 240 VAC OPERATION (DETAIL 'A') RECONNECT TRANSFORMER PRIMARY LEADS AS SHOWN. CHANGE FUSE, F1 TO 4A, 250V SLO-BLO.
4. FOR ACCESSORY SWITCH SW-2, WIRING OPTIONS, SEE DETAIL 'B'
SCHEMATIC
700-348

G. PARTS LIST

1 - REGULATOR BOARD 700-332 and 504-240

ITEM	DESCRIPTION	PART NO.
	Resistors	
R101	68ohm,1/2W,10%	4701-0680-044
R102	68ohm,1/2W,10%	4701-0680-044
R103	.18ohm,15W,±10%(wire wound)	4707-0188-046
R104	.18ohm,15W,±10%(wire wound)	4707-0188-046
R105	.18ohm,15W,±10%(wire wound)	4707-0188-046
R106	33ohm,1/2W,5%	4701-0330-034
R107	390ohm,1W,5%	4701-0391-035
R108	470ohm,1/2W,5%	4701-0471-034
R109	15K,1/2W,5%	4701-0153-034
R110	1K,Trimmer	4751-0102-005
R111	1K,1/2W,5%	4701-0102-034
R112	2K,1/2W,5%	4701-0202-034
	Capacitors	
C101	5MF,50V,85°C(ELECTROLYTIC)	1513-0050-004
C102	.002MF,20%,50V(DISC)	1523-0202-002
C103	.0047MF,±10%,100V(MYLAR)	1508-0472-610
C104	.01MF,+80-20%,25V(DISC)	1502-0103-004
C105	470MF,50V(ELECTROLYTIC)	1513-0471-004
C106	.01MF,+80-20%,25V(DISC)	1502-0103-004
	Diodes	
CR101	Sil Rect	4806-0000-004
	Transistors	
Q101	Transr	4801-0000-001
Q102	Transr	4802-0000-002
	Integrated Circuits	
IC101	I.C.	3130-0000-015
	Thermistors	
RT101	Thermistor	5300-0000-001

2 - CHASSIS

ITEM	DESCRIPTION	PART NO.
	Capacitors	
C1	.33MF,10%,100V(MYLAR)	1508-0334-610
C2	.33MF,10%,100V(MYLAR)	1508-0334-610
C3	.33MF,10%,100V(MYLAR)	1508-0334-610
C4	.33MF,10%,100V(MYLAR)	1508-0334-610
C5	25000MF,35V(ELECTROLYTIC)	1516-3270-400
C6	25000MF,35V(ELECTROLYTIC)	1516-3270-400
	Diodes	
CR1	Diode	4820-0000-001
	Transistors	
Q1	Transr	4803-0000-010
Q103	Transr	4803-0000-010
Q104	Transr	4803-0000-010
	Transformers	
T1	60 Hz	5604-6052-300
T1	50 Hz	5604-6403-800
	Miscellaneous	
SW1	On/Off switch (PSC-1422)	5112-3409-000
SW1	On/Off switch (BPS-20)	5115-3270-101
SW2	Accessory switch (BPS-20)	5115-3270-201
	AC receptical (PSC-1422)	2105-3413-400

SECTION II - INSTRUCTION MANUAL

D.C. POWER SUPPLIES

BPS-20 LH - COMBINATION BASE STATIONS ONLY

A. GENERAL DESCRIPTION

The BPS-20 LH is a 20 Amp - 14 VDC power supply capable of operating from 50/60 Hz, 115/230 VAC. The power supply housing is capable of containing any of Regency's two-way mobile radios and power amplifiers in a combination that will yield a high power base station.

The BPS-20 LH contains all the parts required to assemble a high power base station except the mobile transceiver and the power amplifier. The dealer may then stock BPS-20 LH, mobile radios, and power amplifiers and combine them into systems as desired.

B. OPERATION

The BPS-20 LH has an on-off switch on the front panel that controls the AC input to the power supply. A microphone with a 5 pin connector (MA-93) is shipped in a second box. The accessory switch is wired so the internal speaker operates in the off mode and the external speaker operates in the on mode (thru the three pin connector on the back of the package). The accessory switch can be internally connected for other functions as the user desires (a patch board area is provided for this function, See Figure 4).

The controls on the front of the radio function as in the mobile installation. Please read the proper manual for radio operation. The faceplate also contains a slot for a station card if desired.

C. RADIO AND PA DECK INSTALLATION

The BPS-20 LH contains parts to interconnect two different size radios (BTL size and BTH size). The following instructions will reflect different parts based on radio size.

1. Upon removing the BPS-20 LH from the packing carton, remove the top cover mounting screws and the shelf mounting screws. (See Fig. 1) The top cover can now be removed and the parts kit (inside the BPS-20 LH) can be removed.

2. Unbox and prepare your mobile radio for mounting in the station. Remove the ¼ x 20 x ½" bolts, mounting bracket, cover, knobs, faceplate, and bezel. Save all of these parts for later use. Also remove the speaker. (On BTL radios also remove the microphone connector and bracket by removing the two sheet metal screws and unplugging the wires from the microphone connector.)

3. Select the proper transceiver cover for your radio from the parts kit. Also select the proper microphone interconnect cable, DC power interconnect cable, and speaker interconnect cable. (See Fig. 2)

4. Interconnect the cables to the radios as shown in Figure 3. Plug or attach all connectors where indicated.

5. Place the radio in the radio cover and mount the radio with the ¼ x 20 x ½" bolts previously removed from the radio. Dress cables coming out of the radio as shown in Fig. 3A. Mount the radio on the tray with 6 sheet metal screws (provided in the kit) with the controls overlapping the front of the tray. (BTH radios require the use of the four bezel mounting screws to mount the front chassis of the BTH radio to the tabs from the tray and the cover. The tabs should be behind the front chassis. (BTL radios require the use of the four bezel mounting screws to mount the side tabs of the BTL radio cover.)

6. Plug the cables into the BPS-20 regulator board as indicated in Fig. 4. (The DC cable for the power amplifier is already installed.)

7. Place the radio and the tray into position with the BPS-20. (See Fig. 1)

8. Add the mobile power amplifier by removing the six screws holding the cover and the two bolts holding the mounting bracket. Then set the bracket and cover aside. Insert the RF cables and DC cables into the proper connectors as indicated in Fig. 3A. Then mount the P.A. Deck with the front panel in the opening at the back of the unit with the four screws provided in the kit.

9. Test the station at this point for operation by plugging in the AC plug, turn on the unit and the radio light should light on the radio. Test both the receiver, and transmitter for proper operation, i.e., receiver sensitivity, transmitter power output, frequency and modulation. If adjustments are necessary, make them at this time (Refer to proper service manual). Check the P.A. Deck in the pass mode and on mode. If this is not in adjustment, make the proper adjustments at this time. (Refer to proper service manual).

10. Once the units have been properly tuned and checked o.k., then mount the mounting tray and the cover as shown in Fig. 1.

11. Select the proper BPS-20 front panel from the kit and use the 8 4-40 machine screws from the kit, and mount the front panel. (See Fig. 5) Then using the double sided adhesive provided in the kit, mount the proper radio faceplate (BTL faceplates in kit - BTH, Micro-Com from radios). Place the knobs on the radio and add the microphone and the installation is completed.

D. OTHER INSTALLATION NOTES

1. Accessory switch can be wired for other options by plugging proper wires in the patch board area. See service manual for information or check schematic diagram.

FIGURE 1

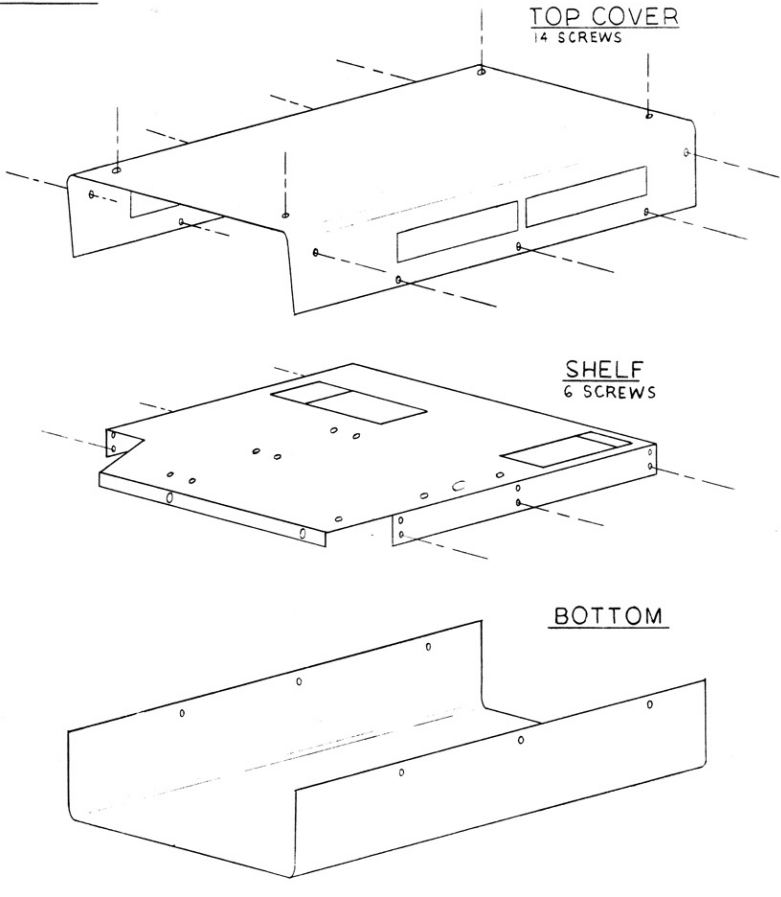


FIGURE 2

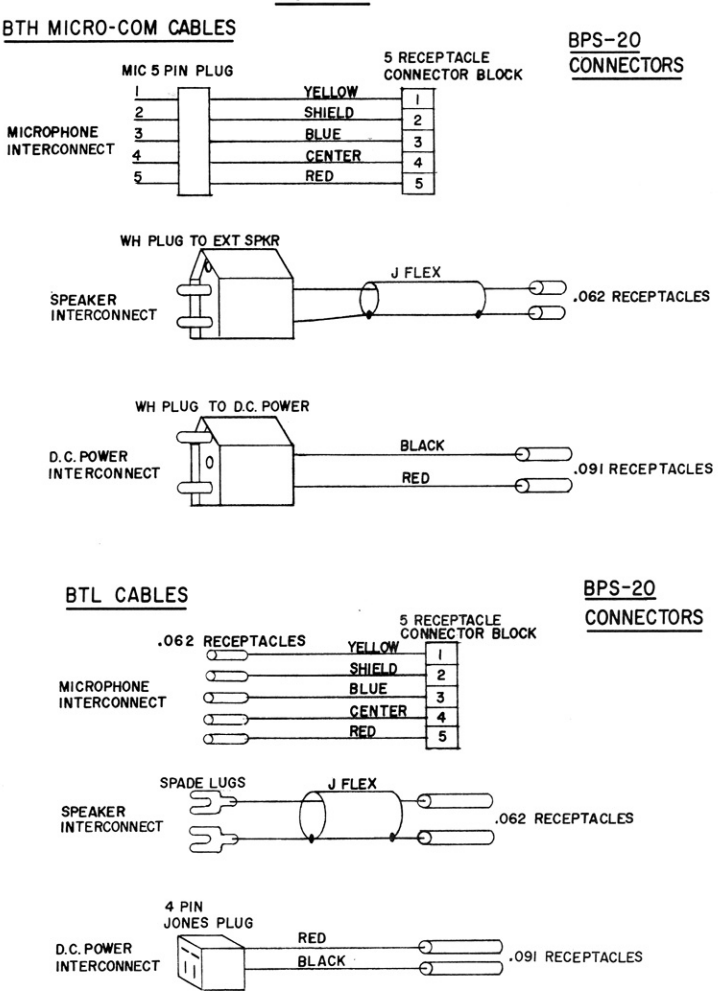
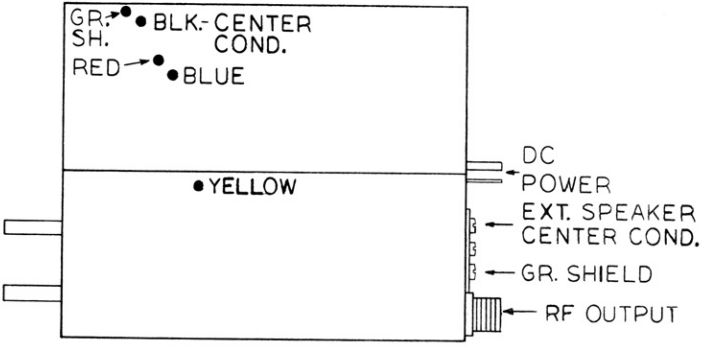

BTH MICRO-COM CABLES
BPS-20 CONNECTORS
MIC 5 PIN PLUG
5 RECEPTACLE CONNECTOR BLOCK
MICROPHONE INTERCONNECT
1 YELLOW 1
2 SHIELD 2
3 BLUE 3
4 CENTER 4
5 RED 5
WH PLUG TO EXT SPKR
J FLEX
SPEAKER INTERCONNECT
.062 RECEPTACLES
WH PLUG TO D.C. POWER
D.C. POWER INTERCONNECT
BLACK
RED
.091 RECEPTACLES
BTL CABLES
BPS-20 CONNECTORS
5 RECEPTACLE CONNECTOR BLOCK
.062 RECEPTACLES
MICROPHONE INTERCONNECT
YELLOW 1
SHIELD 2
BLUE 3
CENTER 4
RED 5
SPADE LUGS
J FLEX
SPEAKER INTERCONNECT
.062 RECEPTACLES
4 PIN JONES PLUG
D.C. POWER INTERCONNECT
RED
BLACK
.091 RECEPTACLES

FIGURE 3

BTL RADIOS



BTH/MICRO-COM RADIOS

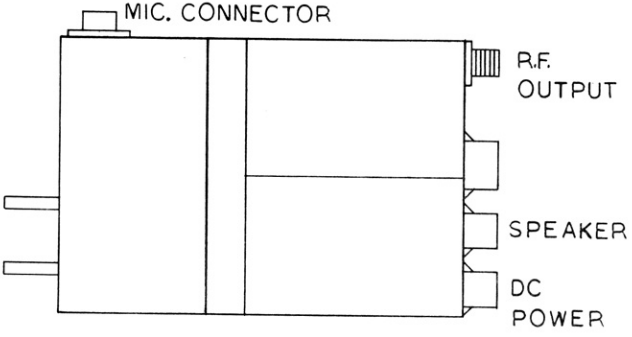
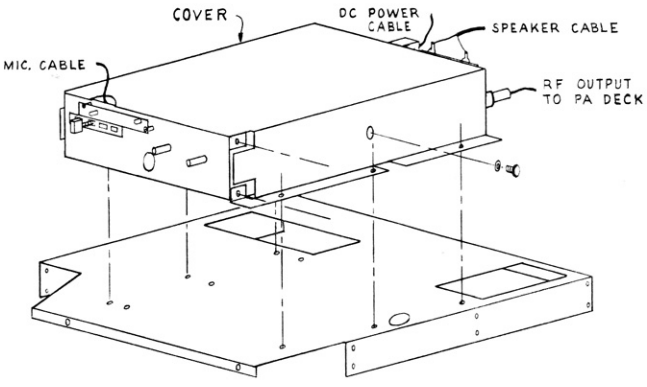
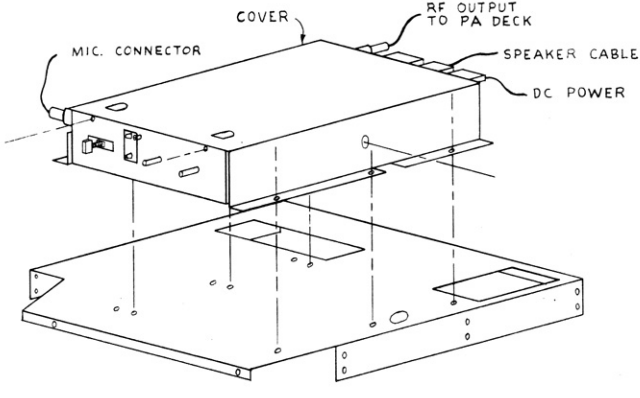


FIGURE 3-A

BTL



BTH



PA DECK

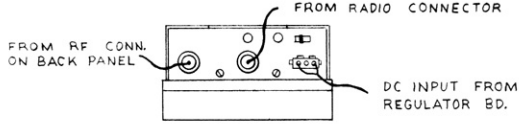


FIGURE 4

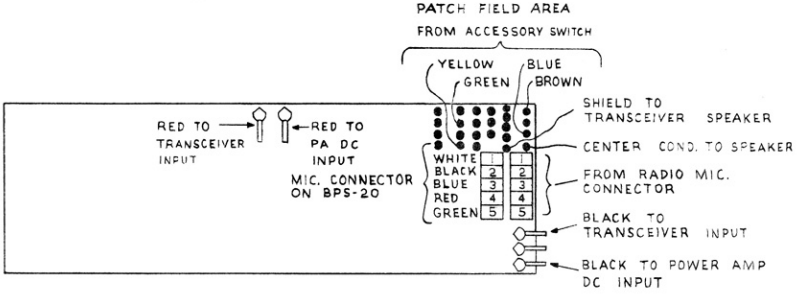
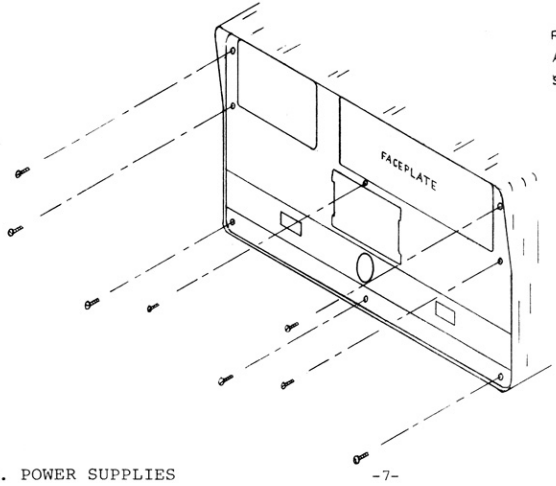


FIGURE 5



RADIO FACEPLATE APPLIED WITH DOUBLE SIDED ADHESIVE

LIMITED WARRANTY

This Power Supply is sold under a 90 day warranty, which warrants it to be free from defects in material and workmanship. We agree to repair or replace at the point of manufacture, without charge, all parts showing such defects, provided the unit is delivered to us, intact for our examination, with all transportation charges prepaid to our factory, within 90 days from the date of sale to the original purchaser, and provided such examination discloses in our final judgement, that it is thus defective. Pilot lights, tubes,vibrator, fuses and diodes shall be covered by the manufacturer's standard EIA warranty and such items shall be excluded from the provisions of this warranty.

This warranty does not apply if the Power Supply has been subjected to misuse, neglect, accidents, incorrect wiring not our own, improper installation, or put to use in violation of instructions furnished by us, nor to Power Supplys that have been damaged by lightning, excess current, repaired or altered outside our factory, nor to the Power Supply that has had its serial number altered or removed.

CHANGES

The Company reserves the right to modify or change the equipment, in whole or in part, at any time prior to delivery in order to include refinements deemed appropriate by the Company, but without incurring any liability to modify or change any equipment previously delivered, or to supply new equipment in accordance with earlier specifications.