

Mobile Communications



MDX™
WALLMOUNT STATION

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Interconnect Board	LBI-39046
Keypad/Frequency Select Board	LBI-39047
Remote Interface Board	LBI-39048

Maintenance Manual

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SYSTEM SPECIFICATIONS*

FREQUENCY RANGE	(Refer to Mobile Radio Specification)
INPUT VOLTAGE	90-130 VAC @ 50-65 Hz 180-260 VAC @ 50-65 Hz
INPUT POWER	
Standby	60 Watts
Receive	100 Watts
Transmit	500 Watts
POWER OUTPUT RATINGS	(Refer to Mobile Radio Specification)
DUTY CYCLE (EIA)	Receiver 100%, Transmitter 20%
TEMPERATURE RANGE	-30°C to +60°C (-22°F to +140°F) (Performance specified per EIA)
SPEAKER	4 ohms
DIMENSIONS (HxWxD)	54 x 57.2 x 17.5 cm. (21 x 22 x 6 inches)
WEIGHT	66 pounds with MDX Radio

*For detailed transmitter and receiver specifications, refer to the appropriate mobile Maintenance Manual.

DESCRIPTION

The Wall Mount Station Combination utilizes state-of-the-art microcomputer technology for high value and reliability. The most advanced manufacturing techniques are used to provide the highest quality radio possible.

The Tone Remote station provides four (4) frequency and the EDACS system provides five (5) frequency operation.

The station is available in all frequency bands and power levels available in the MDX Mobile Radio Units. It operates from 120 or 240 VAC power supplies at frequencies of 50 or 60 Hz. Input power variations of ±20% are tolerated.

MECHANICAL PACKAGE

The station is housed in a slim (less than 7 inches) and compactly built cabinet, occupying a minimum of space. It consists of a Mobile Radio, Remote Board, Interconnect Board and Power Supply. The Interconnect Board has the Interface (19D902931G1) Board with the station three (3) watt audio stage on it. The Keypad Frequency Select Board (344A3383P1) is mounted on the Interconnect Board. The power on-off switch (circuit breaker) is located on the Power Supply. The radio has its own power on-off switch. A System Interconnect cable connects the Interconnect board, Remote board and Power Supply with the radio.

The station radio combination can be equipped with:

- RF Channel Synthesizer
- Microcomputer Control System
- Two Channel Tx/Rx
- ±0.0002% or ±0.0005% stability
- Ultra High Sensitivity Preamp
- Tone or Digital Channel Guard
- MDX Microphone

MDX™ RADIO PACKAGE

The MDX Mobile Radio is a synthesized, wideband radio that uses integrated circuits and microcomputer technology to provide high performance trunked operation. This radio operates in the Enhanced Digital Access Communications System (EDACS) trunking environment, and in conventional communications systems.

All radio functions are stored in a programmable Electrically Erasable **PROM (EEPROM)**. The radio is field pro-

grammable using an IBM compatible personal computer with the following equipment.

- Serial Programming Interface Module TQ3370
- Programming Cable (19B801417P10) TQ3372

With this cable and software, any PC can be used to program (or re-program) customer system frequencies, Channel Guard Tones, and options. Option selection is done during radio initialization using the PC programmer.

The MDX Mobile Radio assembly contains the following circuit boards and assemblies:

- Power Amplifier Board
- RF Board
- System Board
- Audio/Logic Board
- Audio Amplifier Board
- Front Cap Assembly

The circuit boards are all mounted on a main casting to provide easy access for servicing. Interconnect plugs are used to connect the boards.

TONE AND EDACS REMOTE

The EDACS remote boards provide the electrical interface between the Local Controller and the Base Station. They generate the required tones for selecting remotely controlled functions. Refer to the Maintenance Manual for the individual remote board for detailed information. The manuals for these boards are:

- Four Frequency Tone Remote -
19A704686P6 LBI-31552
- EDACS Five Function Tone Remote -
19A704686P8 LBI-38119

POWER SUPPLY

The Power Supply is a self-contained module that provides a single output of 13.8 VDC. Refer to the Power Supply Maintenance Manual LBI-38751 for detailed information on the 13A Supply and LBI-38893 on the 30 Amp supply.

CONTROL PANEL

Both the Power Supply and Radio have power ON-OFF switches. Operating controls located on the station control panel on the System board are: (1) the REMOTE On-Off switch, (2) the INTERCOM On-Off-Mom switch, (3) the SPEAKER On-Off switch, (4) VOLUME control, (5) Power LED, and (6) Microphone connection.

REMOTE Permits the serviceman to communicate through, or monitor, the operating channels.

INTERCOM Provides Intercom capability between the station and remote controller when ON. Intercom is disabled when OFF. Provides momentary connection for Intercom calls in the MOM position.

SPEAKER Connects the speaker to the receiver audio from the radio.

VOLUME Adjusts the station audio level.

PROGRAMMING

The MDX Wall Mount Station is programmed using an IBM compatible personal computer equipped with an RS-232 port. Options TQ3370 and TQ3372 are both required for programming the radio. TQ3370 provides the RS-232 serial interface unit and the cable connection from the unit to the PC. TQ3372 provides the software and the cable from the interface unit to the radio microphone jack. Programming is provided on both 3.5 inch and 5.25 inch diskettes.

After the radio is programmed, the station power should be turned OFF and then back ON.

BATTERY STANDBY OPTION

A battery standby option is available to permit continued station operation in the event of an AC power failure. The option provides internal switching in the station to a customer-supplied 13.8VDC battery supply.

NOTE

The battery standby option does not charge the standby batteries.

The standby battery option consists of a relay (K1) mounted on the station chassis, with a cable that interconnects the station power supply, the station power cable, and the external power supply. When the station is powered by an AC voltage, relay K1 of the battery standby option is en-

ergized and the station receives DC power from the internal power supply. If the AC line power fails, relay K1 is no longer energized, and DC power is supplied from the back-up battery. When the AC power returns, K1 reenergizes and DC power is again supplied from the internal power supply.

OPERATION

The station ON-OFF switch is located on the power supply. When this ON-OFF switch is ON, all controls on the radio should be active except for the volume control.

NOTE

Before leaving the station make sure the REMOTE switch is ON and all other switches are OFF.

Monitoring a Channel

1. Set the power supply ON-OFF switch to ON.
2. Set the radio power ON-OFF switch to ON.
3. Set the SPKR switch to ON.
4. Select the desired channel.
5. Adjust the VOLUME control to a comfortable listening level.
6. When monitoring is complete return the REMOTE switch to ON and all other switches to the OFF position.

Intercom To Local Controller

1. Set the power supply ON-OFF switch to ON.
2. Set the radio power ON-OFF switch to ON.
3. Plug microphone into mic jack J1 on left side of the control panel.
4. Set SPKR switch to ON.
5. Set INTERCOM switch to ON.
6. When receiving, set VOLUME control for comfortable listening level.
7. When communications are completed return the REMOTE switch to ON and all other switches to the OFF position.

Radio Communications

To Receive A Message

1. Set the power supply ON-OFF switch to ON.
2. The microphone PTT switch keys the transmitter on the channel indicated. If more than one frequency is available, select the desired frequency using the radio frequency selector.
3. Set the SPKR switch to ON.
4. The station is now ready to receive messages from other radios in the system. When the first call is received, it may be necessary to adjust the VOLUME control for the desired listening level.

To Transmit A Message

1. If more than one channel is available, select the proper channel using the radio frequency selector.
2. Monitor the channel to make sure no one else is using the channel.
3. Press the PTT switch on the microphone. Then speak into the microphone using a normal speaking voice. Always release the PTT switch as soon as the message is completed, and listen for an answer to the call.

MAINTENANCE

PREVENTIVE MAINTENANCE

To ensure high operating efficiency and to prevent mechanical and electrical failures from interrupting system operations, routine checks should be made of all mechanical and electrical parts at regular intervals. This preventive maintenance should include the checks as listed in the table of Maintenance Checks that follows.

ASSEMBLY AND DISASSEMBLY

Easy access to the station is inherent in this design. Simply unlock the door and swing it open. The station and radio package are hinged so that they can swing out for servicing.

To release the entire station and allow it to swing out, remove the three screws on the left that secure the chassis to the cabinet brace. Then press the spring clip.

Loosening the right side radio mounting screws allows the radio package to hinge open, providing access to the Remote Board, Interconnect Board, and Option Boards.

Remote Board

To remove the Remote Board, remove the POZIDRIVOR® screw in the four corners of the board and remove the board. Unplug cabling as necessary.

Interconnect Board

To remove the Interconnect Board, remove the four screws securing it to the chassis and disconnect all cabling. Remove the Interface Board and/or the Keypad Board if necessary.

OPTION INSTALLATION INSTRUCTIONS

Most options are MDX radio options, and are thus the same in both installation and operation when the radio is used in the Wall Mount application. Refer to the applicable Maintenance Manual for mobile radio options.

TABLE OF MAINTENANCE CHECKS

	INTERVAL BETWEEN CHECKS	
	Every Six Months	As Required
Transmitter Alignment - Compare meter readings with voltages read during initial tune up. Check power output. (See Alignment Procedure for Transmitter.)		X
Receiver - Retune the front end and check meter readings taken during initial tune-up. (See Alignment Procedure for Receiver.)		X
Transmission Line - Check for positive indication of pressure on transmission line pressure gauge (if pressurized line is used).	X	
Antenna - Check antenna and mast for mechanical stability.	X	
Mechanical Inspection - Visually check cables, plugs, sockets, terminal boards, and components for good electrical connection. Check for tightness of nuts, bolts, and screws to make sure that nothing is working loose from its mounting.	X	
Cleaning - Use a vacuum cleaner to remove accumulated dust inside the cabinet.	X	
Frequency Check - Check transmitter frequency and deviation as required.		X

BATTERY STANDBY OPTION

An external battery can be used to power the station in the event of AC power failure. The battery and charger must be supplied by the customer. The standby option consists of Option Cable Assembly 19B802942. Refer to the Battery Standby Option Application Assembly for installation.

NOTE

The battery standby option does not recharge the battery.

INITIAL ADJUSTMENT AND CHECKOUT

After the station has been installed as described in the Installation Manual, the following adjustments should be made by an authorized electronics technician.

TEST EQUIPMENT REQUIRED

- Deviation Monitor
- Wattmeter, 50 ohms, 150 Watts
- RF Generator, (Station RF Frequencies)
- AC Voltmeter
- 30 dB Decoupler

TRANSMITTER ADJUSTMENT

The adjustment for the transmitter includes measuring the forward and reflected power, adjusting the antenna length for optimum ratio, and then setting the transmitter to rated power output. Next, measure and record the frequency and modulation for future reference. For complete transmitter adjustment, refer to the Alignment Procedure in the applicable radio unit Maintenance Manual.

RECEIVER ADJUSTMENT

Initial adjustment for the receiver includes adjusting the audio output power for 3 watts across the speaker. Refer to the Maintenance Manual for the radio being used for Troubleshooting and Alignment Procedures, or Adjustments.

STATION ADJUSTMENT PROCEDURES

Your station was adjusted at the factory. If adjustment is needed due to board replacement, or other reasons, perform the following steps.

REMOTE SETUP

Receiver to Line

- Turn ON Power and Speaker switches.
- Set REMOTE and INTERCOM switches to OFF.
- Connect the RF Generator to the station. Set the proper RF frequency and a 1 kHz tone at 3 kHz deviation.
- Connect the proper RCN1000 Remote Controller to J11 on the rear of the station chassis.
- No tone should be present at the Remote Controller.
- Turn on the REMOTE switch. A tone should be present at the Remote Controller.
 - On the Tone Remote Board (19A704686P6) set R35 for 0 dBm at J1-3 and J1-4.
 - On the EDACS Tone Remote Board (19A704686P8) set R66 for 0 dBm at TB1-2 and TB1-5.
- Turn OFF the station REMOTE switch. Disconnect the RF Generator and connect the wattmeter to the station through the 30 dB decoupler.
- Apply a 30 mVRMS 1 kHz tone across J101-1 Desk Mic Hi and J101-2 Desk Mic Lo.

- Ground J101-3 Desk Mic PTT. Measure the RF power on the wattmeter.

- With J101-3 grounded, check for 20 to 43 mVRMS, 1 kHz tone across J209-5 (Mic Hi) and J209-7 (Mic Lo). Check to verify that no tone is present at the Remote

Controller. Remove the ground. (An isolation transformer may be required.)

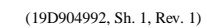
- Switch the INTERCOM switch ON. Ground J101-3 Desk Mic PTT. Check to verify that the radio does not key (no power on the wattmeter). Check to verify that a tone is present at the Remote Controller. Press the INTERCOM switch to the MOM position and check for a tone at the Remote Controller. Release the INTERCOM switch.

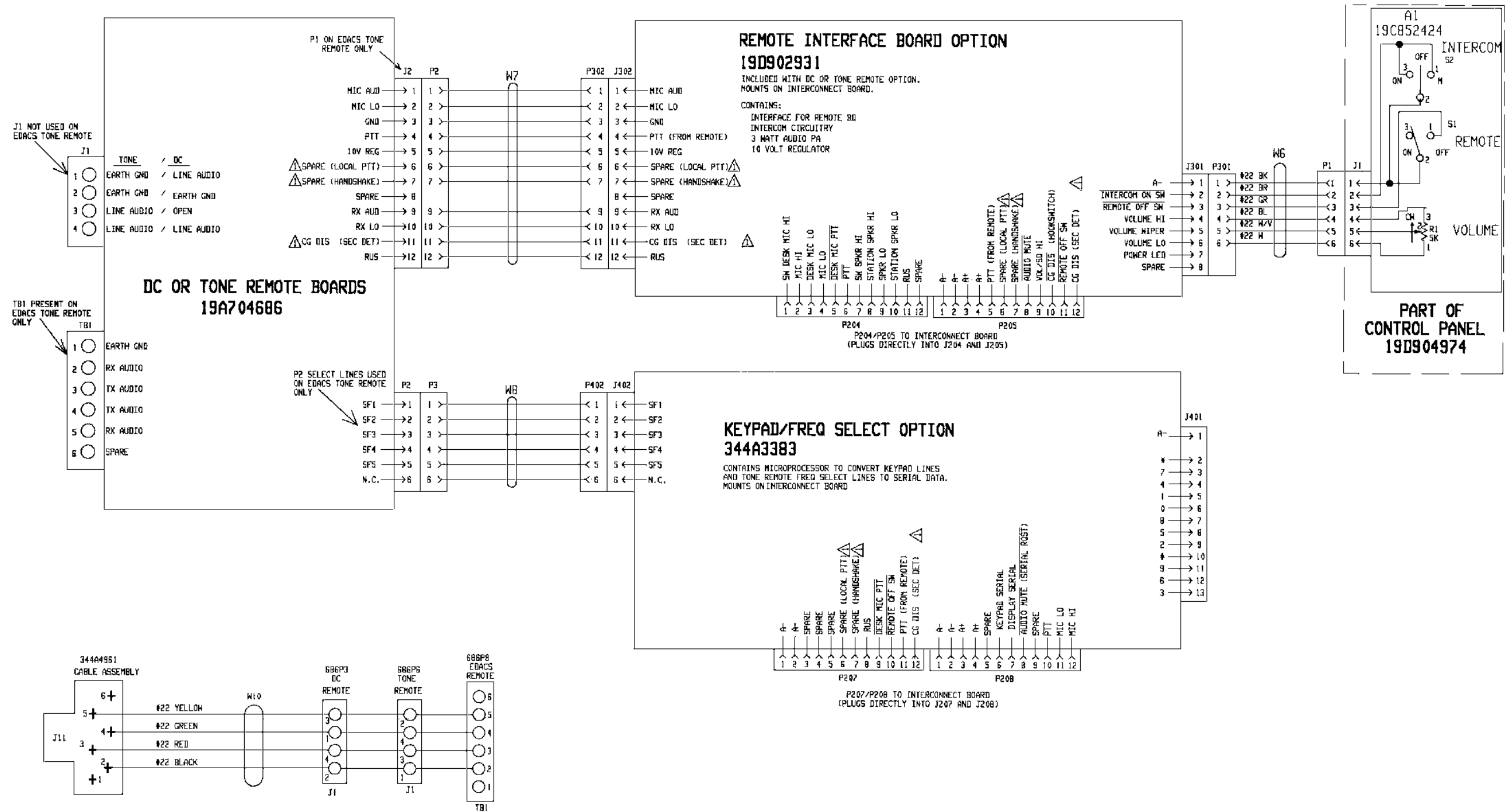
- On the (931) Interface Board, set R323 for 0 dBm at J1-3 and J1-4 on the (686P6) Tone Remote Board..

- On the (931) Interface Board, set R323 for 0 dBm at TB1-2 and TB1-5 on the (686P8) PST Remote Board.

Line to TX

- Set Station Remote switch and InterCom switch to OFF.
- Apply 1 kHz at 120 mV to Microphone input of the Controller.
- On the Controller, press SF5 on EDACS only, and ground PTT. Check to see that the Radio is not keyed.
- Switch the Station Remote switch ON. Key the Controller. Check to see that the radio is keyed.
- The Controller should be preset to 0 dBm.
 - On the 686P6 PST Remote Board, set R60 for 60 mVRMS at J209-5 and J209-7.
 - On the 686P8 PST Remote Board, set R82 for 60 mVRMS at J209-5 and J209-7.
- Before leaving the station, make sure the INTERCOM and SPEAKER switches are OFF, and the REMOTE switch is ON.



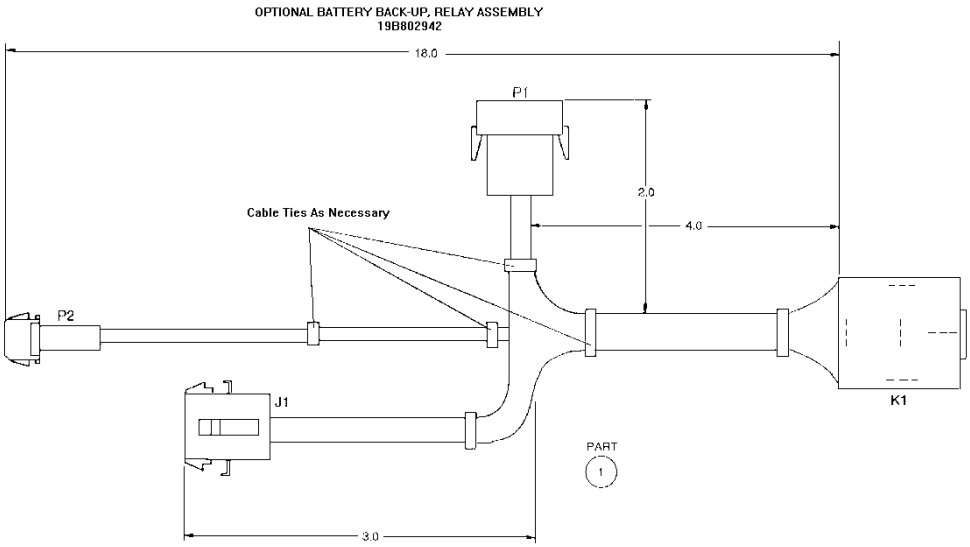
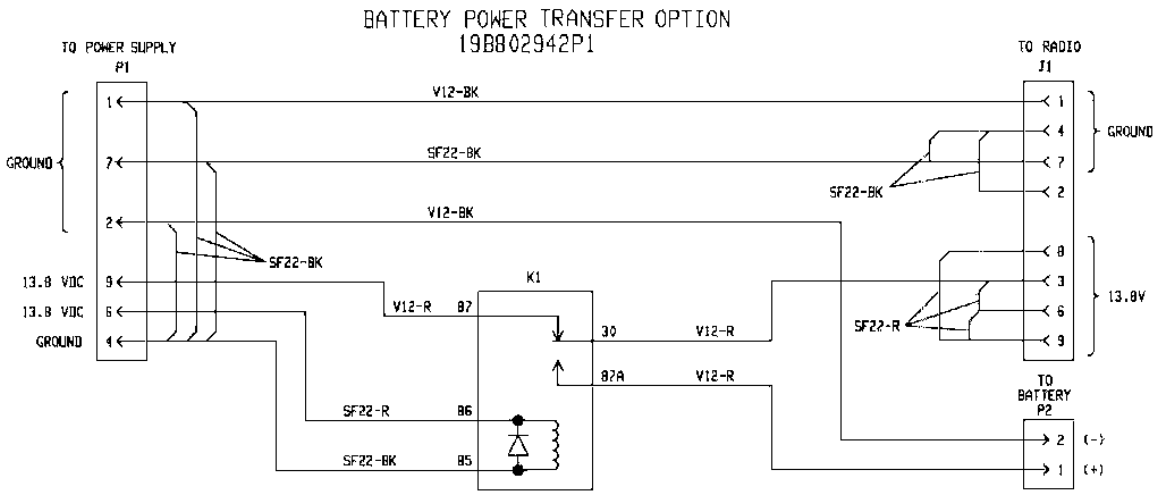


WALL MOUNT STATION

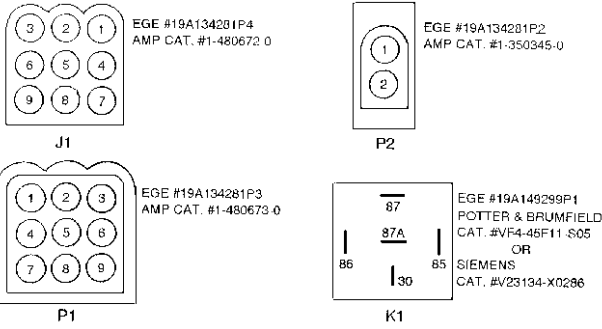
(19D904992, Sh. 3, Rev. 0)

[Optional] Battery Back-Up Relay Assembly

(19B802942, Shts. 1&2, Rev. 0)

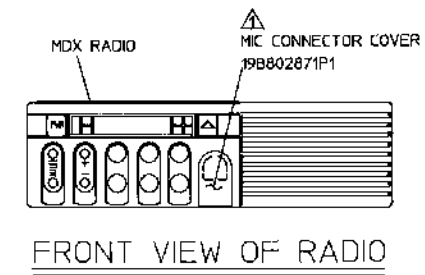
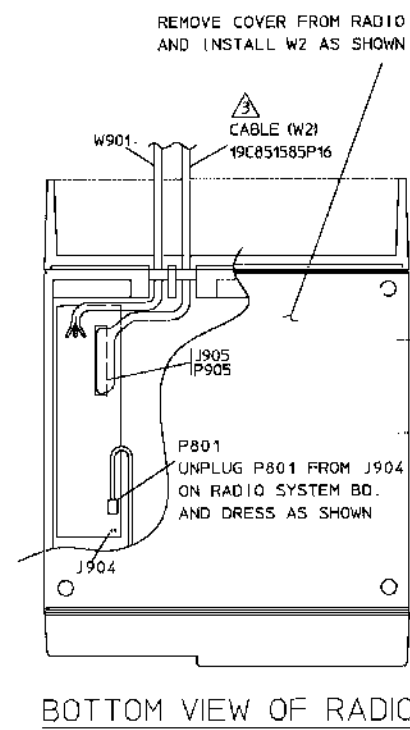
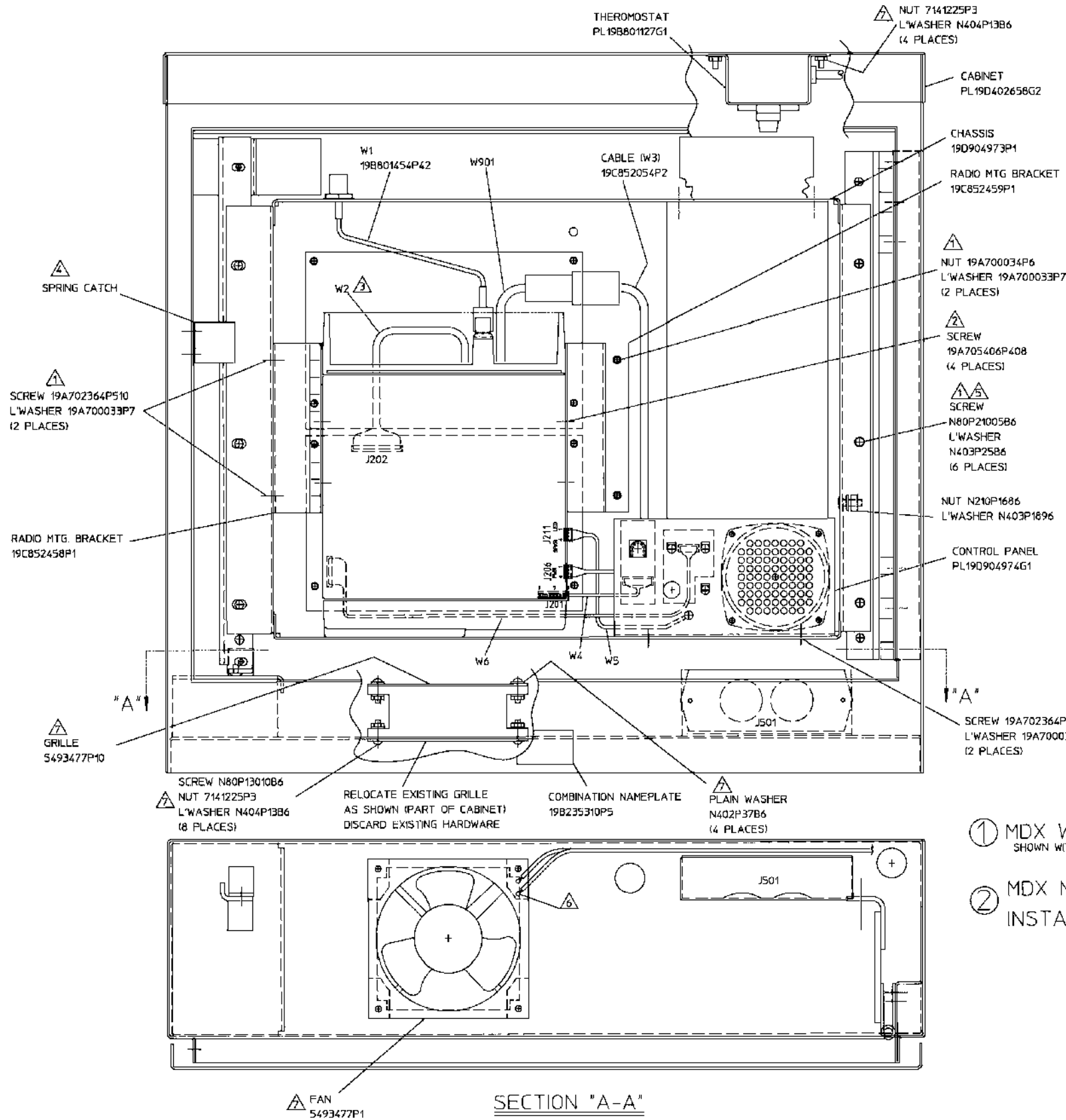


PIN IDENTIFICATION FOR J1, P1, P2, AND K1 FOR PART 1
AS SHOWN FROM WIRE INSERTION SIDE:



WIRE CONNECTION CHART FOR PART 1				
FROM	TERMINATE WITH ITEM	TO	TERMINATE WITH ITEM	WIRE
J1-1	4	P1-1*	6	V12-BK
J1-3*	4	K1-30*	9	V12-R
J1-4*	5	J1-2	5	SF22-BK
J1-6*	5	J1-3*	4	SF22-R
J1-7*	5	J1-4*	5	SF22-BK
J1-7*	5	P1-7*	7	SF22-BK
J1-9*	5	J1-6*	5	SF22-R
J1-9*	5	J1-8	5	SF22-R
P1-1*	6	P1-4*	7	SF22-BK
P1-2*	6	P2-2	6	V12-BK
P1-2*	6	P1-4*	7	SF22-BK
P1-4*	7	K1-85	8	SF22-BK
P1-4*	7	P1-7*	7	SF22-BK
P1-6	7	K1-86	8	SF22-R
P1-9	8	K1-87	9	V12-R
P2-1	6	K1-87A	9	V12-R

* MORE THAN ONE CONNECTION AT THIS LOCATION

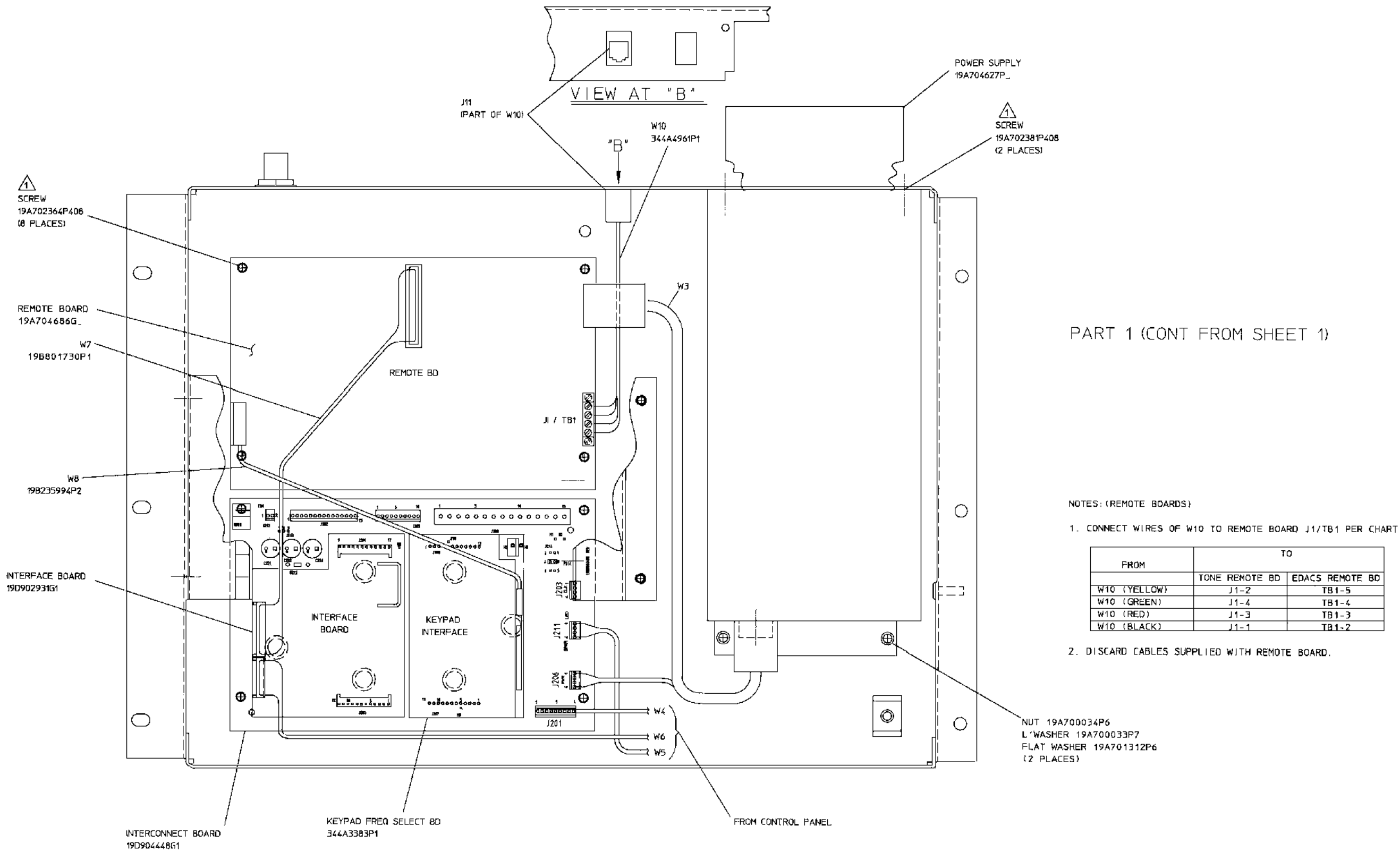


- ① MDX WALL MTG SHOWN WITH DOOR OPEN
- ② MDX MOBILE INSTALLATION

- NOTES:
- ⚠ PART OF HARDWARE KIT 349A9645G1
 - ⚠ THESE ITEMS ARE USED WHEN MOBILE IS FACTORY INSTALLED. IF MOBILE IS NOT FACTORY INSTALLED THESE ITEMS ARE TO REMAIN PACKAGED AND SHIPPED WITH STATION.
 - ⚠ IF STATION IS SHIPPED LESS MOBILE, INSTALL P202 OF W2 (19C851585P16) ONTO J202 OF THE INTERCONNECT BOARD AND LET P905 HANG LOOSE.
 - ⚠ ADJUST SPRING CATCH SO RADIO IS HELD TIGHT IN PLACE IN CLOSED POSITION.
 - ⚠ TORQUE 1/4-20 SCREWS TO 1.8/2.0 NEWTON METERS (16-25 INCH-POUNDS).
 - ⚠ SOLDER BLACK AND WHITE WIRES FROM THERMOSTAT PL19B801127 TO EITHER TERMINAL OF FAN 5493477. SLEEVE SOLDER JOINT.
 - ⚠ THESE ITEMS ARE PART OF FAN THERMOSTAT PL19B801127.

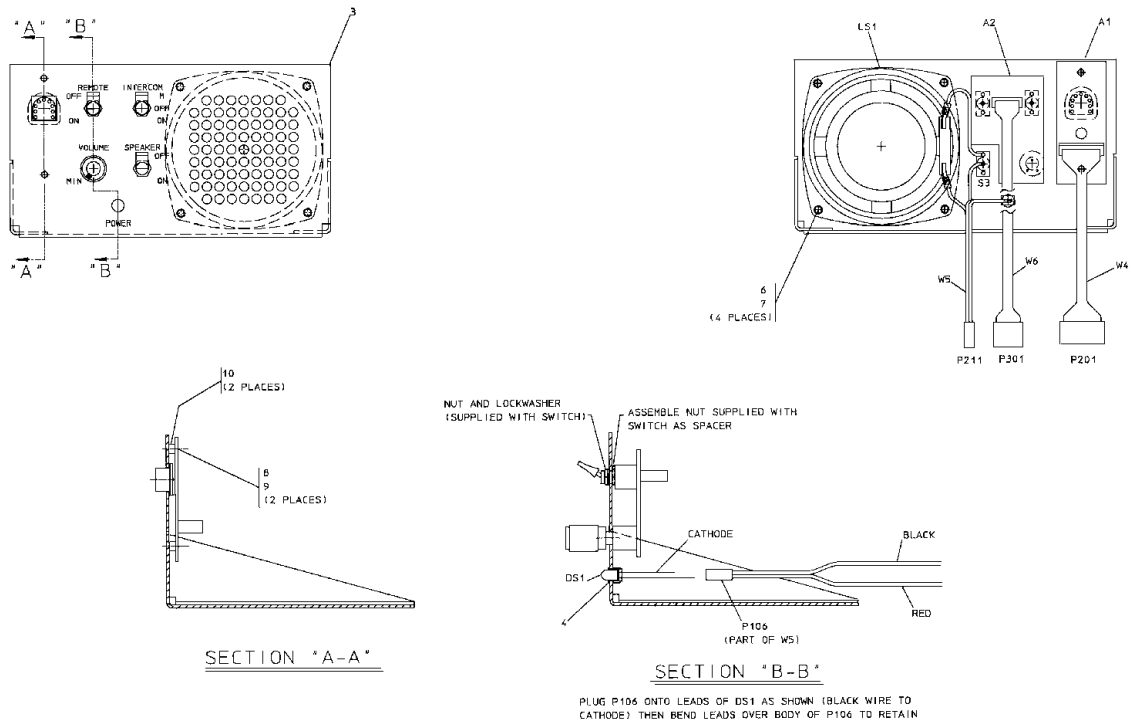
WALL MOUNT STATION ASSEMBLY

(19D904975, Sh. 1, Rev. 1)

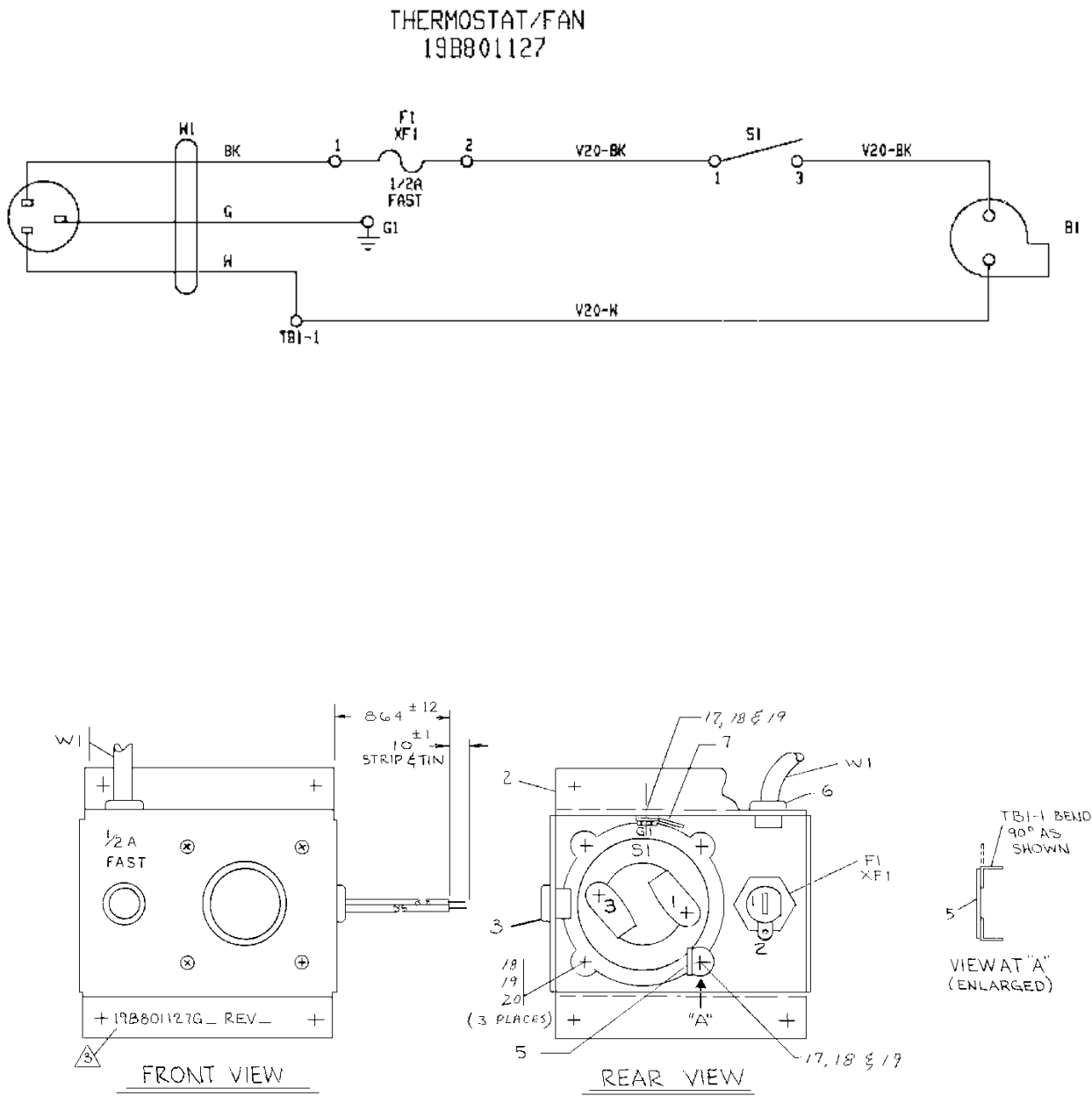


WALL MOUNT STATION ASSEMBLY

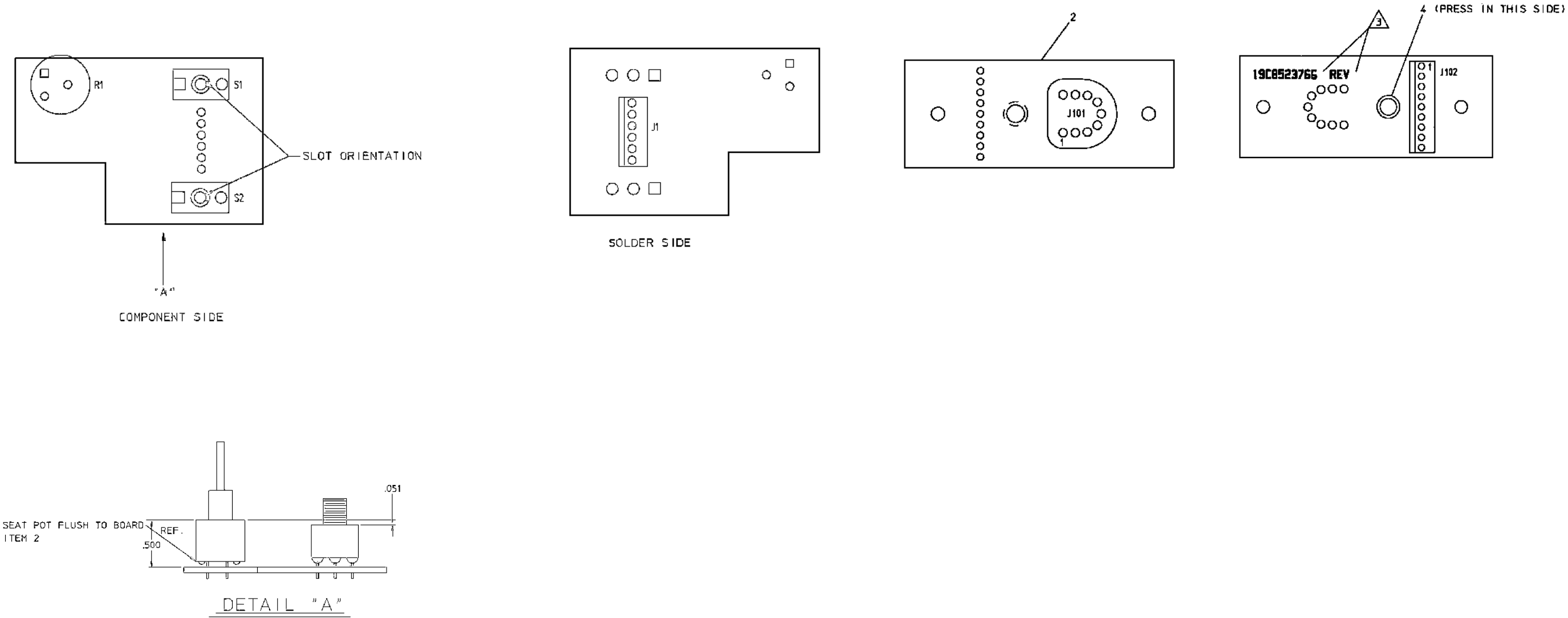
(19D904975, Sh. 2, Rev. 1)



CONTROL PANEL
(19D904974, Sh. 1, Rev. 1)



FAN THERMOSTAT ASSEMBLY
(19B801127, Sh. 1, Rev. 2)



SWITCH PANEL
19C852424G1

MICROPHONE CONNECTOR BOARD
19C852376G1

MDX WALL MOUNT STATION (DSWX01 and DSWX02)		
SYMBOL	PART NO.	DESCRIPTION
J501	19B209343P1	MDX WM STATION CABINET 19D402658G2
		----- JACKS -----
		Connector, Receptacle.
		----- MISCELLANEOUS -----
		3 19A122184P1 Grill.
		4 19B205311P1 Angle.
		6 5491682P14 Rim lock.
		7 N130P1410B6 Thread forming hex head screw.
		8 19D402658P8 Cabinet Assembly.
		9 19A122059P4 Pad.
		10 N130P2416B6 Thread forming hex head screw.
		11 N402P71B6 Plain wide steel washer.
		13 19B205409P1 Latch Spring.
		15 4035267P1 Drive rivet.
		17 N402AP38B6 Plain steel washer.
		18 19B201074P306 Tap screw, Phillips POZIDRIV: No. 6-32 x 3/8.
		21 7763541P6 Retaining Strap.
		22 19A701863P19 Loop clamp: sim to Weckesser 3/8-6.
		----- ASSOCIATED ASSEMBLIES -----
		5 19B205318G1 Hinge support.
		19 19B227009G2 Cabinet.
		19D904973P1 Chassis.
		19C852458P1 Right Radio Bracket.
		19C852459P1 Left Radio Bracket.
A1		CONTROL PANEL 19D904974G1
		MICROPHONE CONNECTOR BOARD 19C852376G1
J101	344A4485P1	----- JACKS -----
		Connector, special; sim to CONXAL E4408.
J102	19A704852P35	PWB Connector.
4	19A702455P1	----- MISCELLANEOUS -----
		Nut, Self-Clinching, M3 x .5: sim to Pen Cat.# KF2-M3.
A2		SWITCH PANEL 19C852424G1
		----- JACKS -----
J1	19A704852P32	Printed wire, two part: 6 contacts, sim to Molex 22-29-2061.
R1	RELUA316255/5	----- RESISTORS -----
		Potentiometer, Panel Mounting, 5K Ω.
S1	19A700189P11	----- SWITCHES -----
		Toggle Switch.
S2	19A700189P12	Toggle Switch.

*COMPONENTS, ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	PART NO.	DESCRIPTION
DS1	19A134354P1	----- INDICATING DEVICES -----
		Optoelectronic: Red; sim to HP 5082-4655.
LS1	344A3269P1	----- LOUDSPEAKERS -----
		Magnet, Loudspeaker, Permanent.
S3	19A700189P11	----- SWITCHES -----
		Toggle Switch.
W4	19B801729P2	----- CABLES -----
		Microphone cable.
W5	344A3337P3	Cable.
W6	19B801735P2	Cable.
3	19D904979P1	----- MISCELLANEOUS -----
		Bracket.
4	19A116677P1	Bushing: sim to Hewlett-Packard No. 5082-4707.
5	19A134939P4	Knob.
6	19A700034P5	Hex nut: No. M3.5 x 0.6.
7	19A700033P6	Lockwasher, external tooth, M3.5.
8	19A700034P4	Nut, hex: No. M3 x 0.5MM.
9	19A700032P5	Lockwasher, internal tooth: No. 3MM.
10	7150186P3	Spacer: approx 1/8 x 1/8 inches dia.
F1	19A701881P18	FAN/THERMOSTAT 19B801127G1
		----- FUSES -----
S1	5496655P1	----- SWITCHES -----
		Thermostat, snap-action: SPST, close on temp rise, auto reset, close at 110F ±5F, open at 95F ±~5F, 25 amp at 120/240 VAC; sim to Metals and Controls 20400-F17-64-F110-1.5.
W1	19A134567P1	----- CABLES -----
		Power, 3 wire, 13 amps at 125 VAC, approx. 6 ft. long.
XF1	19B209005P1	----- FUSE SOCKETS -----
		Fuseholder: 15 amps at 250 v; sim to Littelfuse 342012.
2	19B801129G1	----- MISCELLANEOUS -----
		Support
3	19A702464P2	Strain relief.
5	7775500P46	Phenolic: 1 insulated, 1 ground terminal.
6	19A702464P4	Bushing, strain relief.
11	B5493477P1	Fan assembly, single phase: 115 VAC, 50/60 Hz, 14 w, ccw rotation; sim to Rotron "Gold Seal Venturi Muffin Fan".
12	B5493477P10	Fan Grille.
13	7141225P3	Hex Nut: No. 6-32.
14	N80P13010B6	Screw, Machine, Pan Head: No. 6-32 x 5/8".
15	N404P13B6	Lockwasher, internal tooth: No. 6.
16	N402P37B6	Flatwasher: No. 6.
17	N80P13005B6	Machine screw, Pan Head: No. 6-32 x 5/16".
18	7141225P3	Hex Nut: No. 6-32.
19	N403P13B6	Lockwasher: No. 6.
20	N80P13004B6	Screw, machine, Pan Head; No. 6-32 x 1/4".
21	19J706152P5	Retainer strap: sim to Panduit Corp. SST-1.

SYMBOL	PART NO.	DESCRIPTION
1	19A702381P408	HARDWARE KIT 349A9645G1
		----- MISCELLANEOUS -----
		Tap screw, TORX Drive, M3-0.5 x 8.
		2 19A700034P6 Nut, Hex, M4 x .7.
		3 19A702364P408 Machine screw: TORX Drive, M3.5 - 0.6 x 8.
		4 19A700033P6 Lockwasher, external tooth, M3.5.
		5 344A3480P1 Strain Relief.
		6 19A705406P408 Machine bolt, hexagon: M4 x 0.7.
		7 19B802871P1 Cover, MIC Connector.
		9 19A701312P6 Flatwasher: 1.7 - 1.85 ID.
		10 19A700033P7 Lockwasher, external tooth: #4.
		11 N210P16B6 Nut, Hex, #10-32.
		12 N403P19B6 Washer, Lock, External tooth: #10.
		13 N80P21005B6 Machine screw: 1/4(.250)-20 x .312.
		14 N403P25B6 Lockwasher, external tooth: 1/4(.250).
DSCE9G	19A702364P510	Screw, machine, pan head, TORX DRIVE: M4.
		----- CABLES -----
		19B801454P42 Antenna Cable
		19C851585P16 Radio Option Cable
		344A4961P1 RJ Cable
		19B801730P1 Interconnect/Remote
		19B235994P2 Keypad/Remote
		19C852054P2 Standard Power Supply
		DSSU3H 19B802942P1 Cable/Relay Assembly
		DSSU3H 19B801212G1 Battery Cable