

# Lionel Motherboard Connections; R1.31

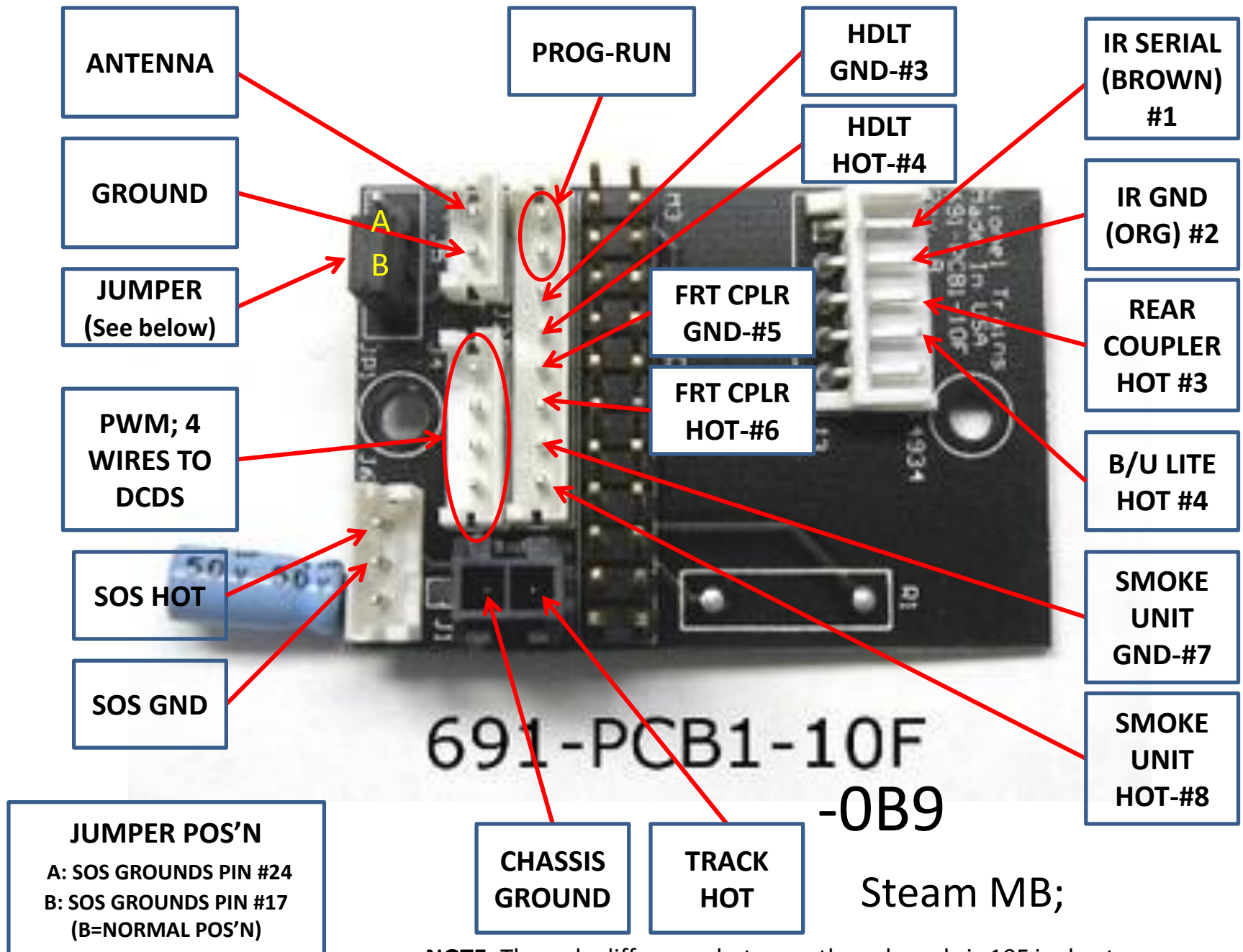
In most cases there is little documentation available for motherboard connections. These slides are intended to assist the service tech and the hobbyist alike.

- Supported motherboards:
- 691-PCB1-10F/0B9      Small steam, other OEM steam
- 691-PCB1-10D      Common steam; no front coupler
- 691-PCB1-036      Common older steam; no front coupler
- 691-PCB1-038      Common tender, Mohawk, 2000 on
- 691-PCB1-B01      Early Legacy, 2007 on
- 691-MB00-15C      Sound only, no AD-20
- 691-MB00-0B0      Sound only, no AD-20
- 691-MB00-16B      Common diesel/electric
- 691-PCB1-11D      Typical Diesel, early TMCC
- 691-PCB1-11E Rev A      Typical TMCC Diesel/Steam mid-2000's
- 691-MB00-19B      Small diesel/switcher
- 691-DCDS-EM2/YU1/FP6      DCDS Board; YU1 & FP6 similar
- 691-PCB1-09F      Small steam tender

Researched and Prepared by Rod D. Stewart; 2012 to May 2019

Not liable for any errors or omissions. The user accepts all responsibility for use of this information.

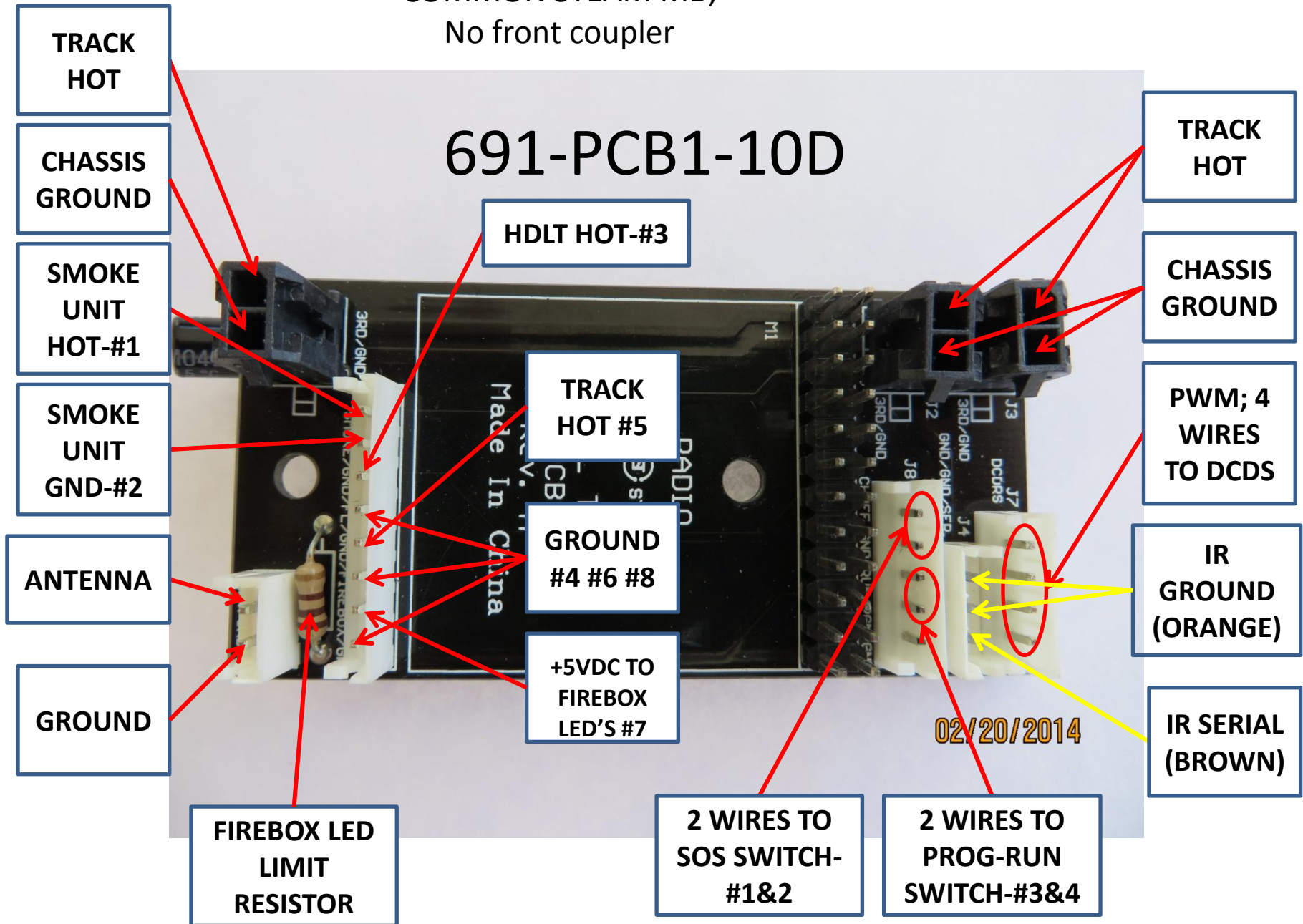
Special thanks goes to Bill Lewis, John Will and Jim Sandman for assistance, pictures, and guidance.



**NOTE:** The only difference between these boards is 10F is shorter.

COMMON STEAM MB;  
No front coupler

## 691-PCB1-10D



STEAM; No front coupler

2 WIRES TO  
PROG-RUN  
SWITCH-#5&6

ONBOARD  
RUN-PROG  
SWITCH

IR SERIAL  
(BROWN)

IR  
GROUND  
(ORANGE)

HDLT  
GROUND-#2

HDLT HOT-#1

TRACK  
HOT

CHASSIS  
GROUND

OPTIONAL  
SOS SWITCH  
GND RETURN

1 WIRE TO SOS -  
CHUFF TRIGGER  
(Ret. To Gnd.)

SMOKE UNIT  
HOT-#3

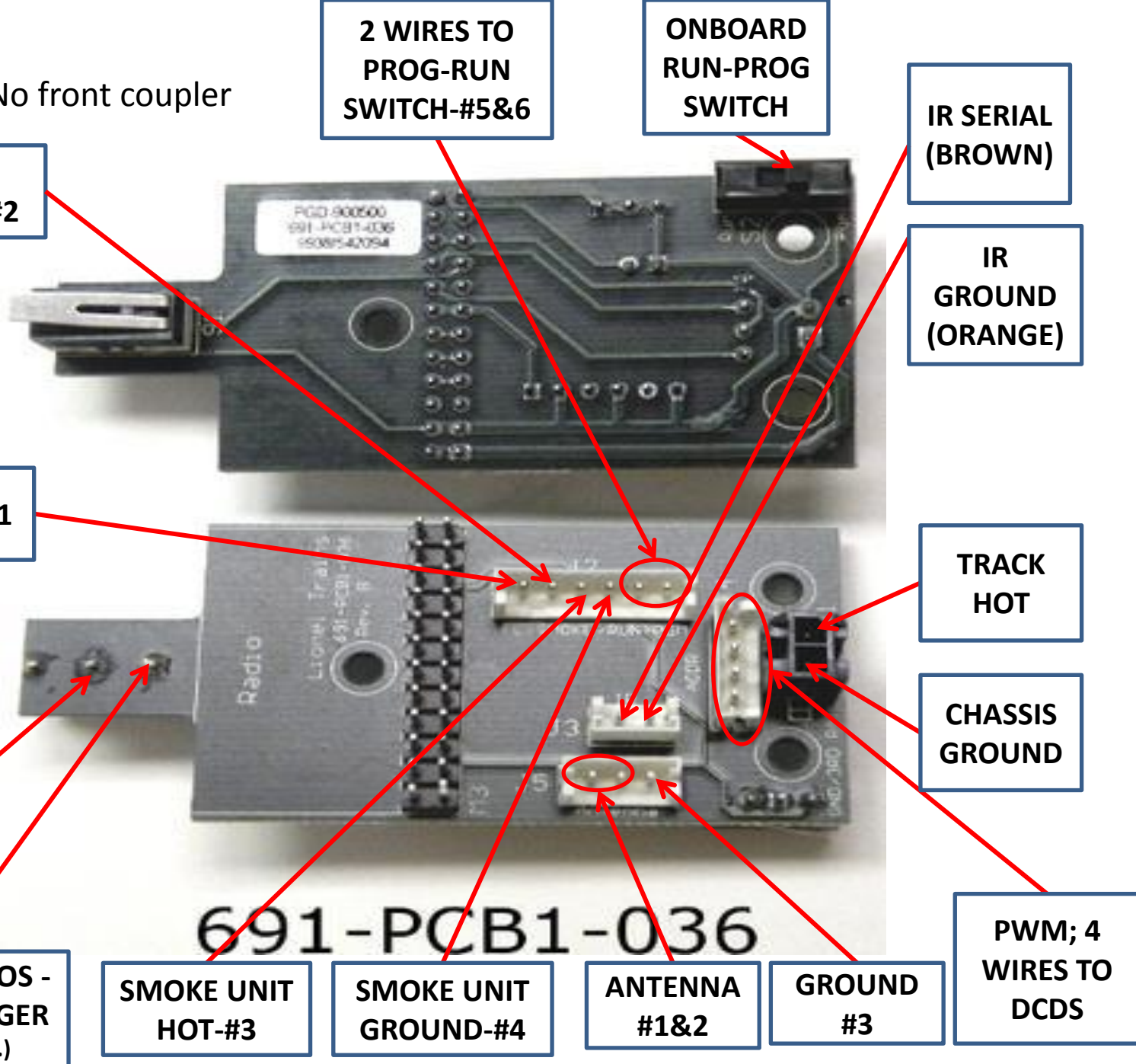
SMOKE UNIT  
GROUND-#4

ANTENNA  
#1&2

GROUND  
#3

PWM; 4  
WIRES TO  
DCDS

691-PCB1-036



2 WIRES TO  
COUPLER

CHASSIS  
GROUND

TRACK  
HOT

IR RCVR  
SERIAL  
(ORANGE)

HOT TO MKR  
LED's  
(Ret. To Gnd.)

IR RCVR  
GROUND  
(BROWN)

2 WIRES TO  
SPEAKER

AD20  
BOARD  
HERE

TO RS-SS  
SWITCH #2  
Ret. under board

2 WIRES TO  
BU LAMP  
#3&4

2 WIRES  
TO BATT.  
#3-BLK (-)  
#4-RED (+)

POWER  
SUPPLY  
BOARD  
HERE

VOLUME  
POT

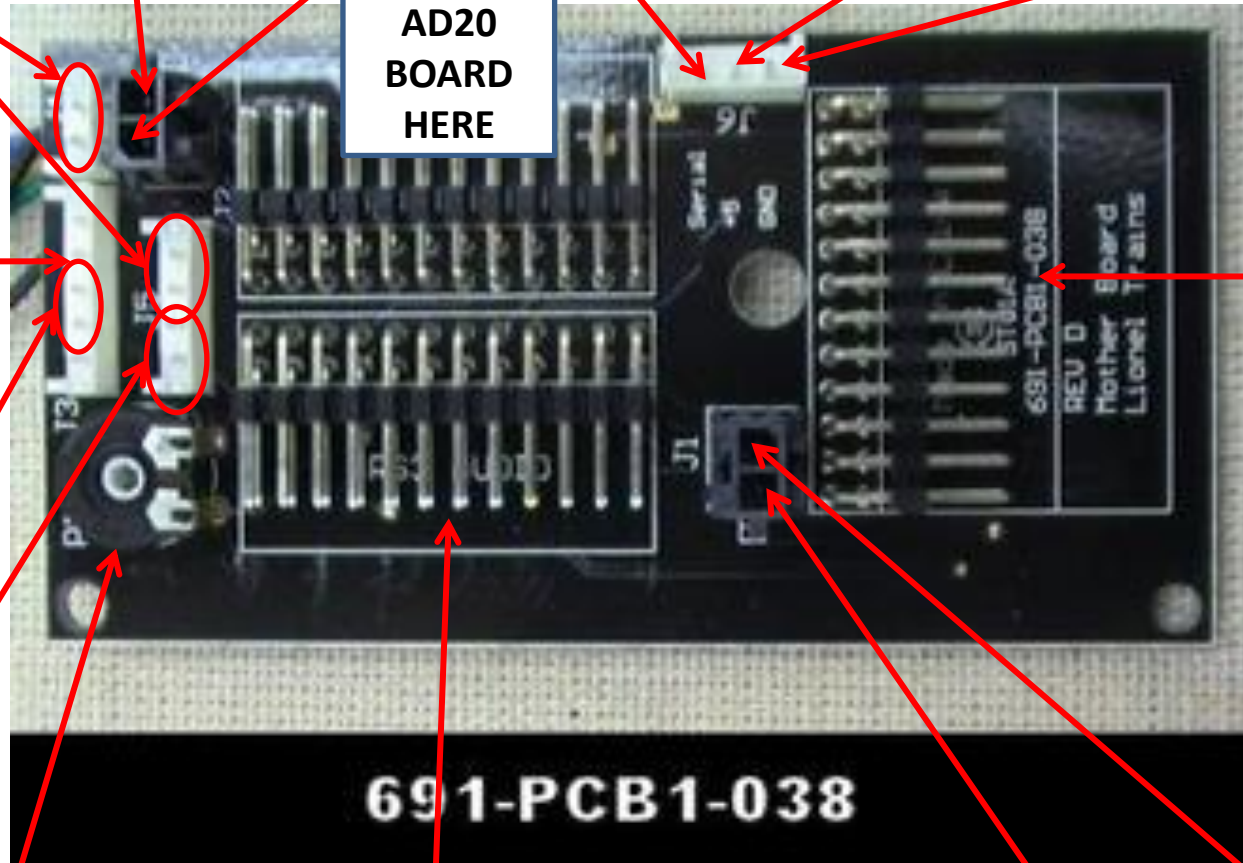
(May be tethered)

RS  
BOARD  
HERE

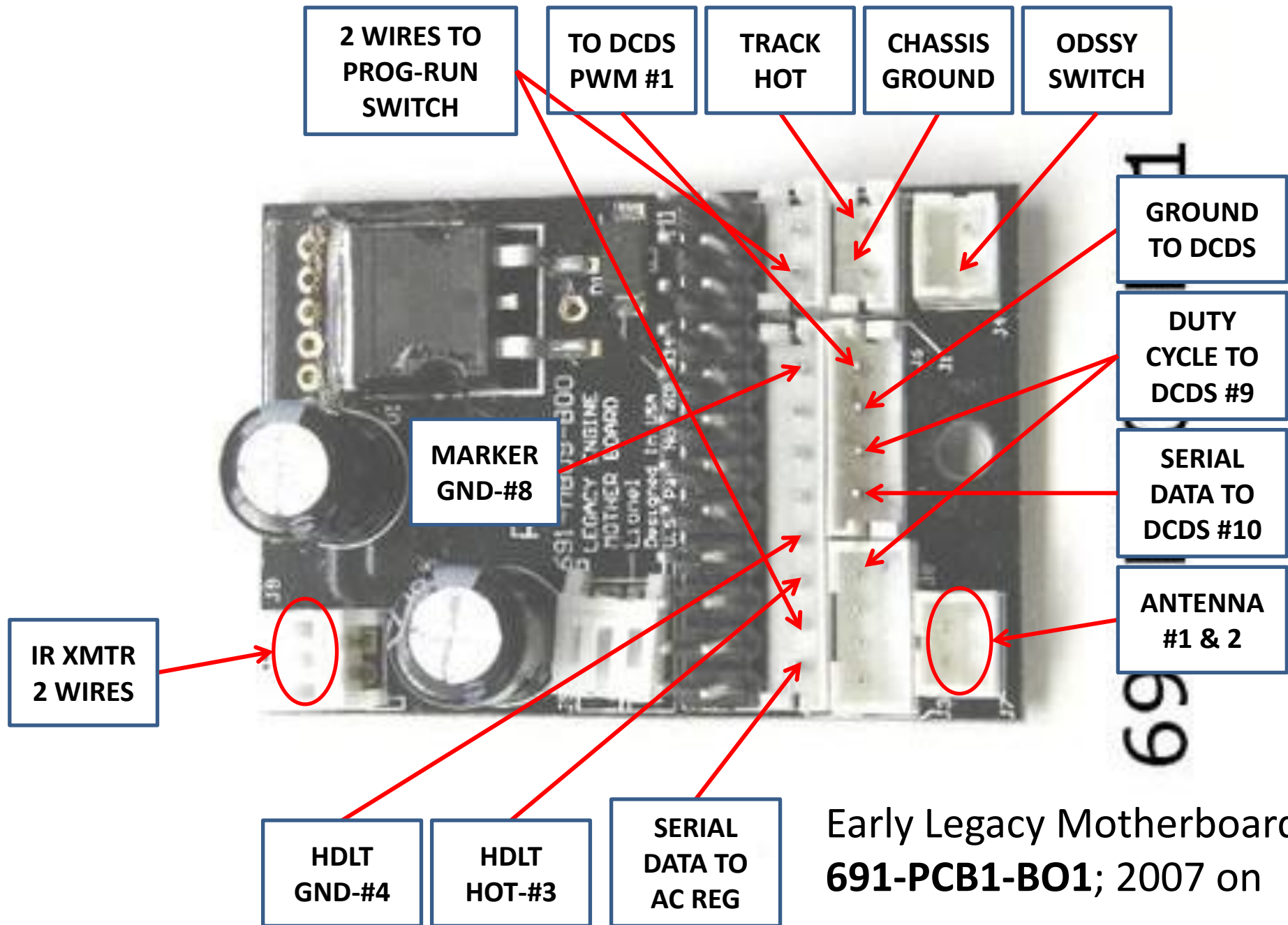
Common STEAM  
Tender MB; 2000  
up until Legacy

CHASSIS  
GROUND

TRACK  
HOT







Early Legacy Motherboard  
**691-PCB1-BO1**; 2007 on

RS  
BOARD  
HERE

2 WIRES TO  
SPEAKER  
(Center = NC)

2 WIRES  
TO SOS

TO RS-SS  
SWITCH

VOLUME  
POT  
(Center = Wiper)

SERIAL

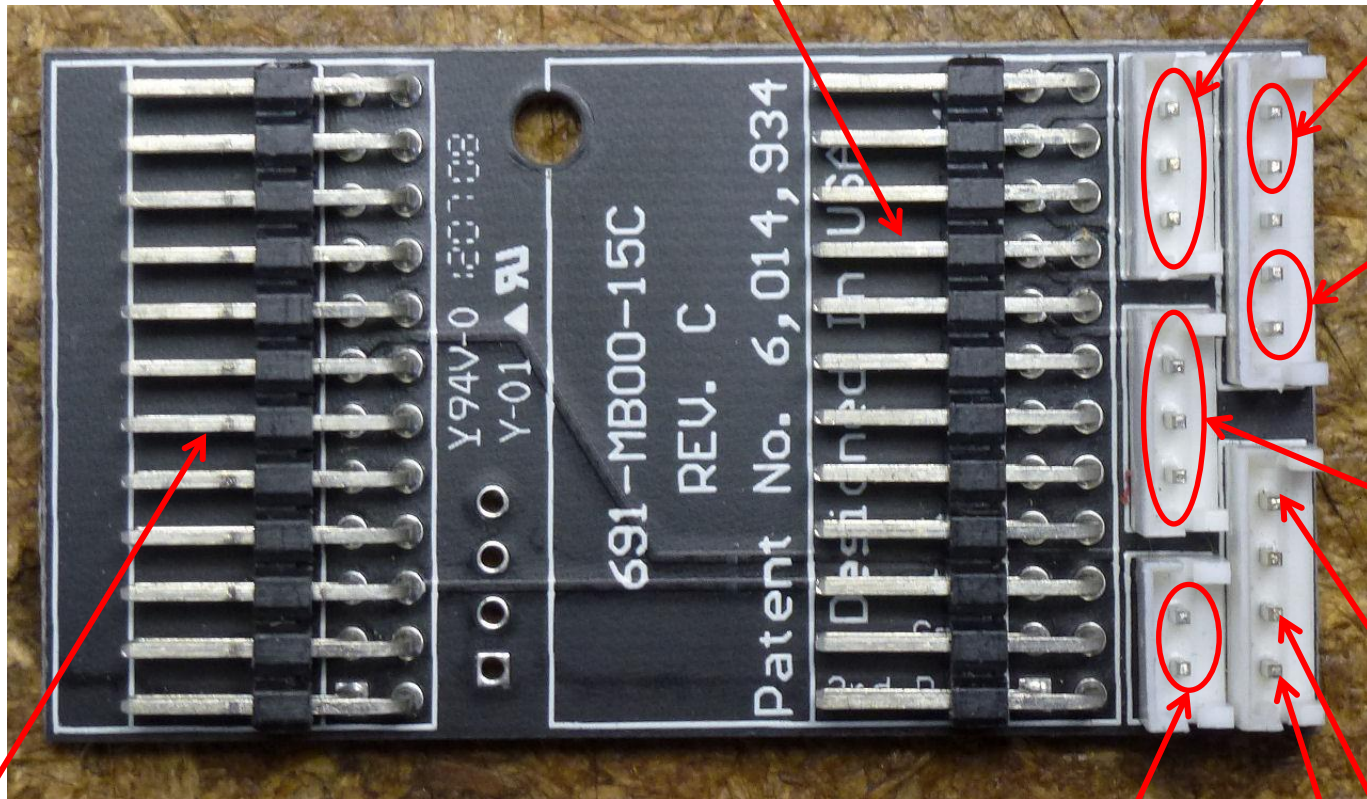
CHASSIS  
GROUND

TRACK  
HOT

TO BATT.  
#1-BLK (-)  
#2-RED (+)

POWER  
SUPPLY  
BOARD  
HERE

691-MB00-15C  
Sound MB (No AD-20)





POWER  
SUPPLY  
BOARD  
HERE

RS  
BOARD  
HERE

VOLUME  
POT  
(Center = Wiper)

AGND/  
NSND (?)

SPEAKER

BATTERY  
#3-BLK (-)  
#4-RED (+)

(Top down)  
GND/L2  
GND/L1

(Top down)  
GND/M2/GND  
M1/RL/+5

BOARD  
MT'D POT

REAR  
COUPLER

GND

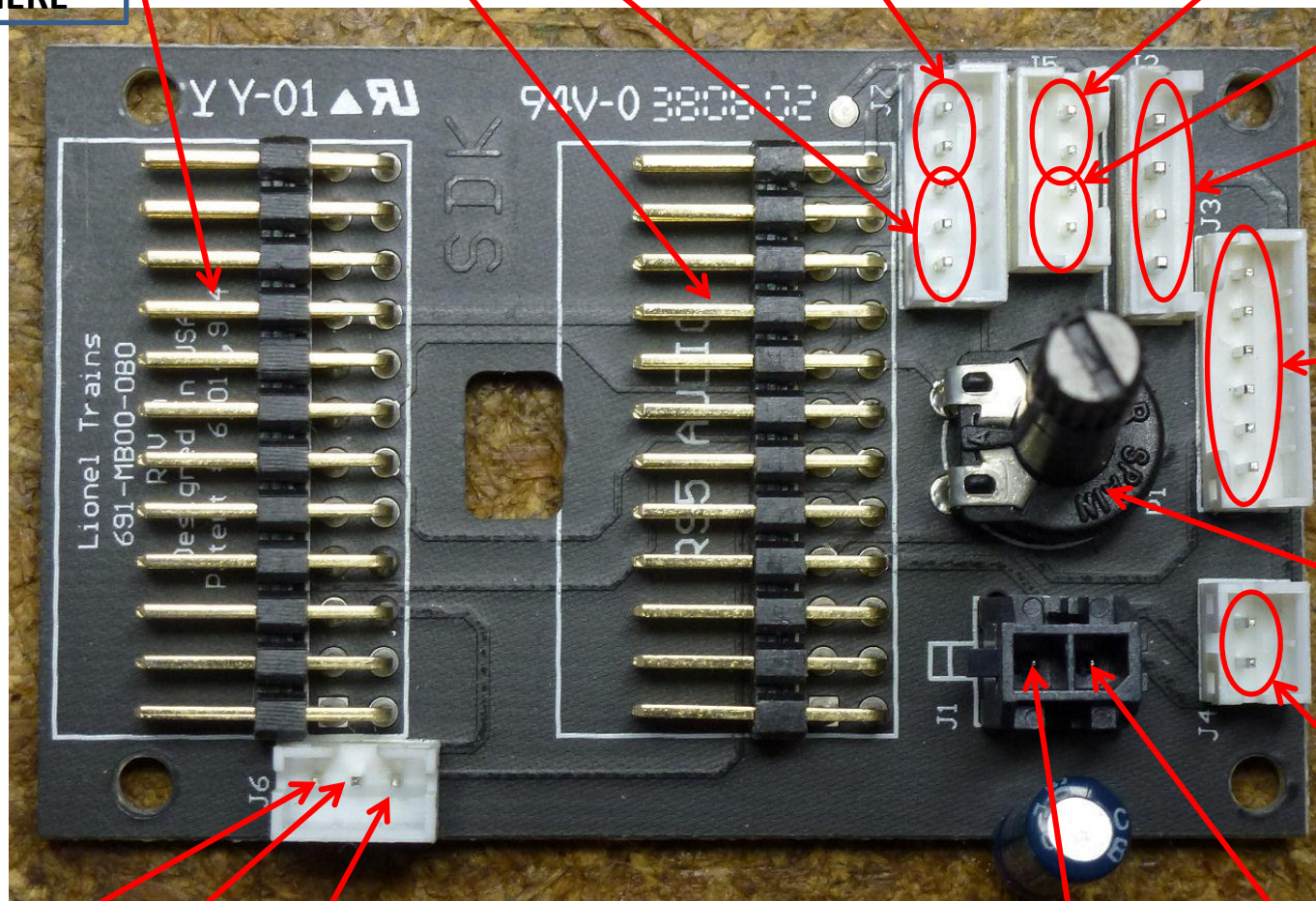
+5V

SERIAL

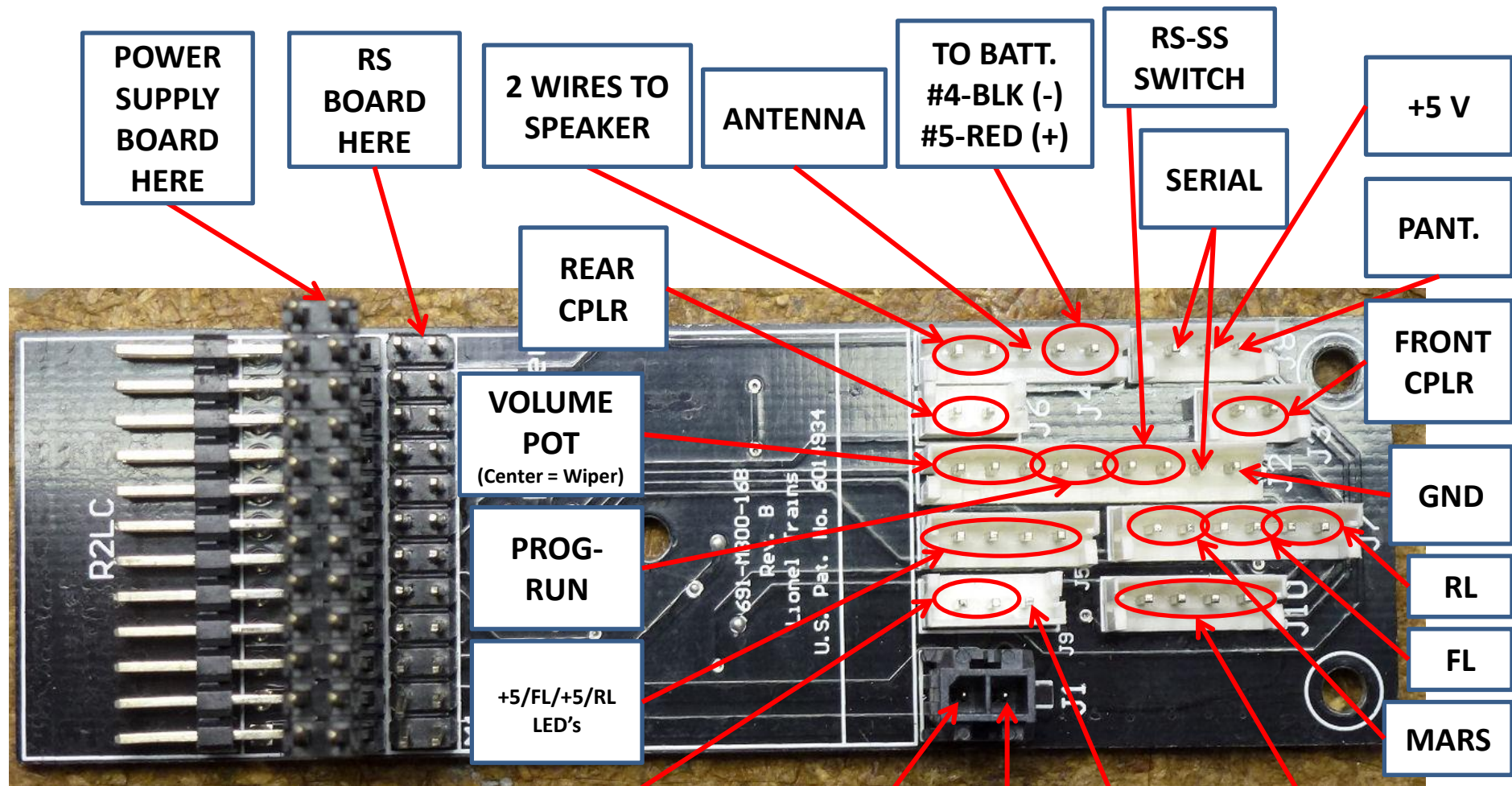
691-MB00-0B0  
Sound MB (No AD-20)

CHASSIS  
GROUND

TRACK  
HOT

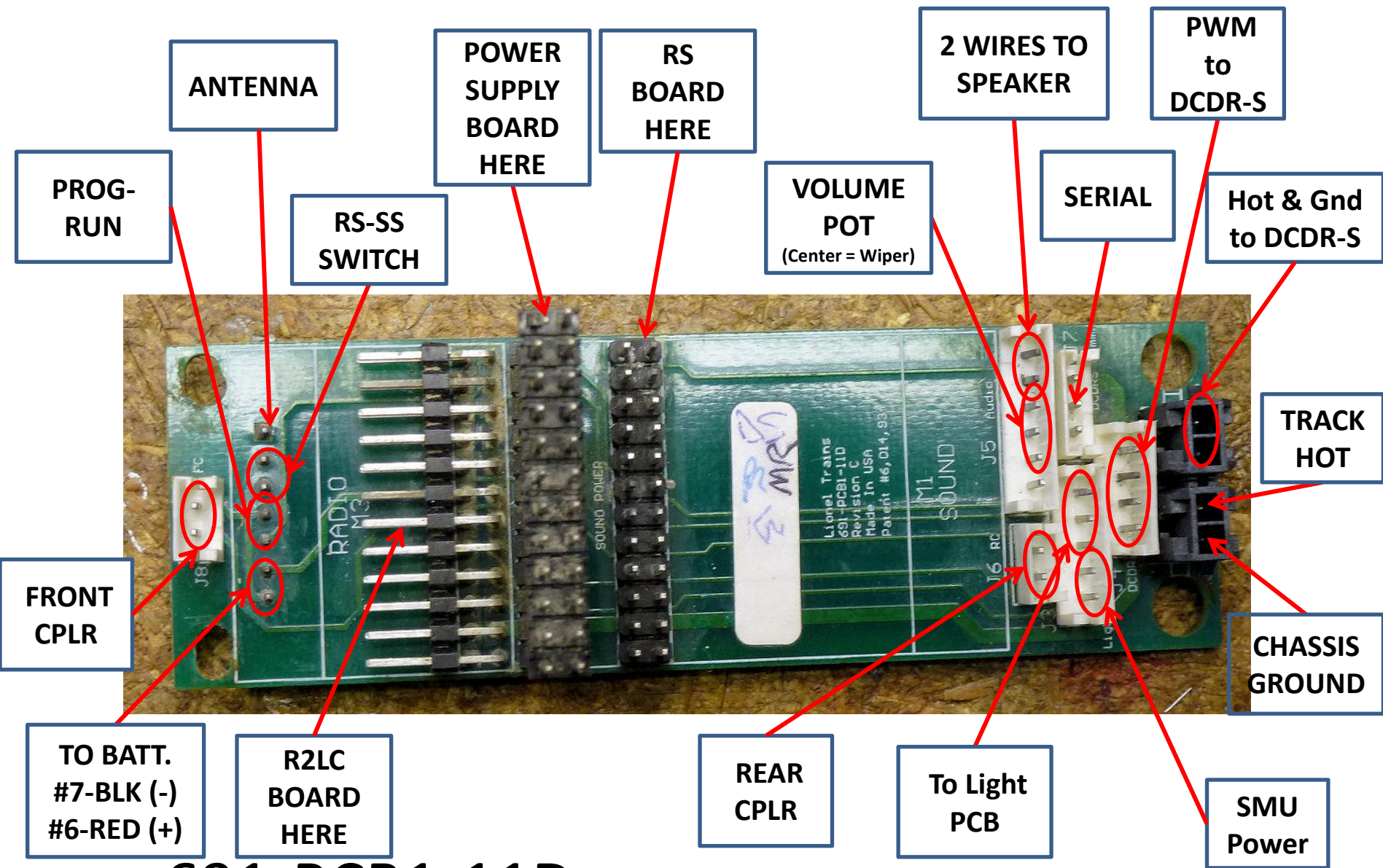






691-MB00-16B

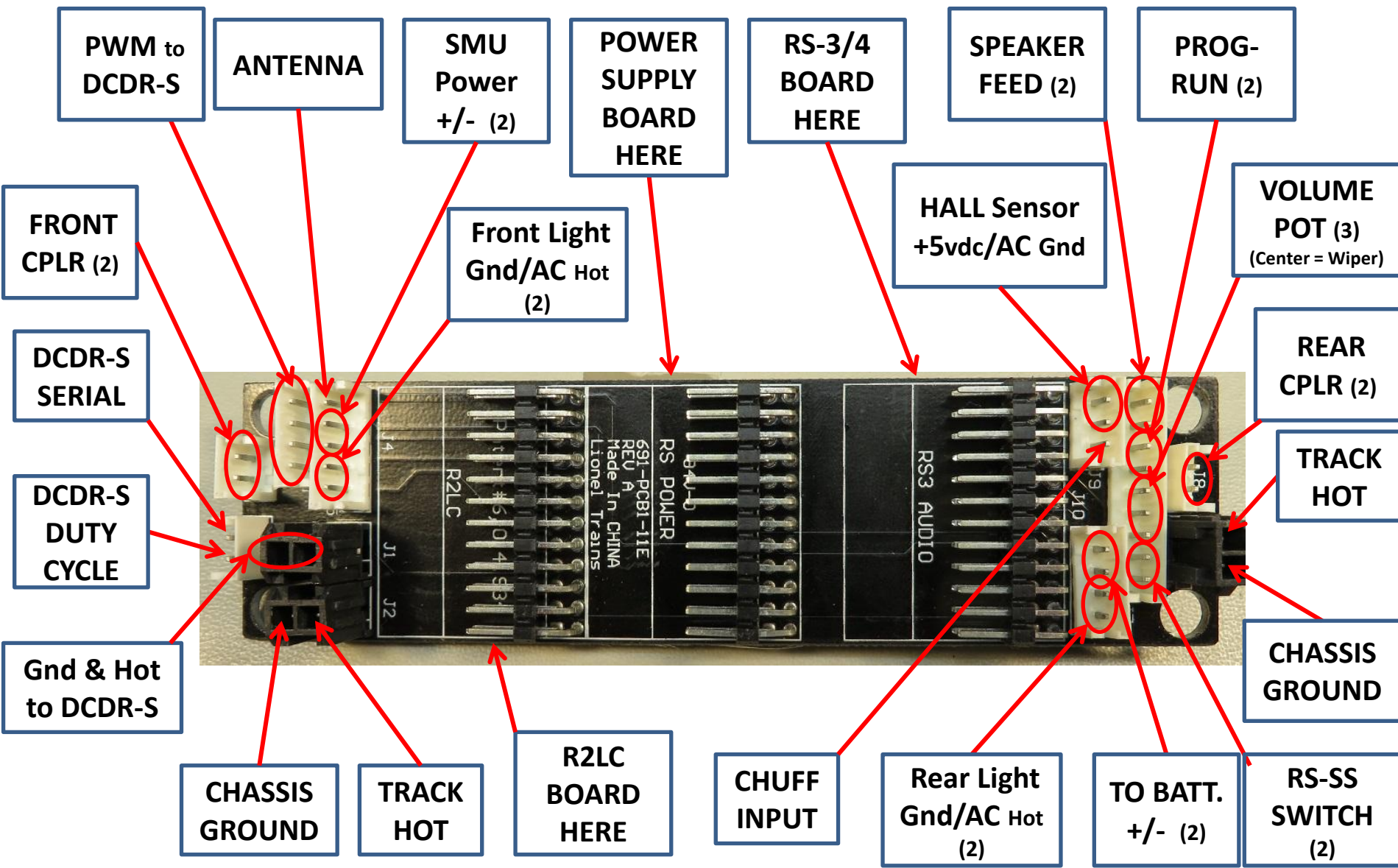
Diesel/Elec MB



691-PCB1-11D

Typical Diesel MB

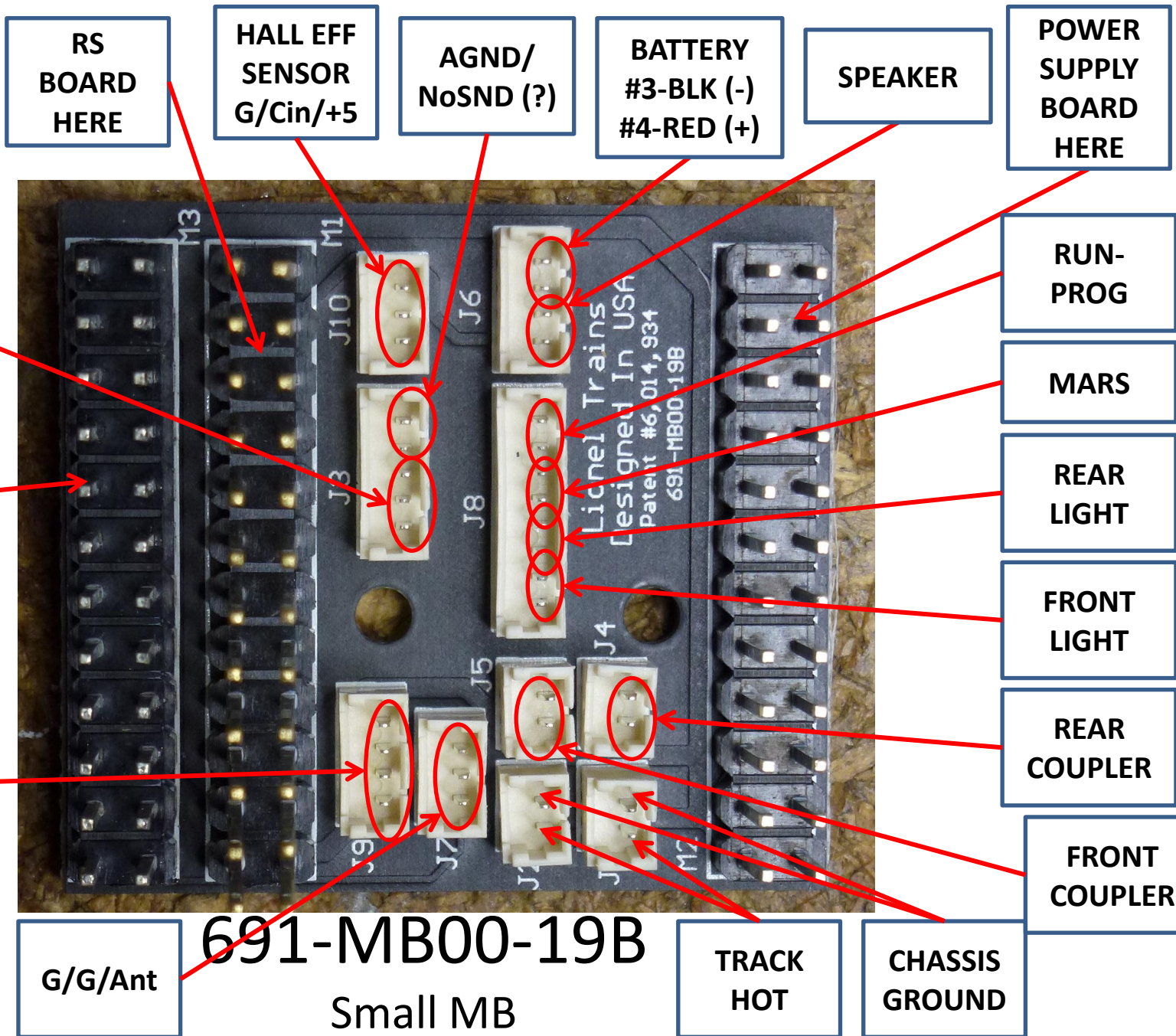




691-PCB1-11E Rev A

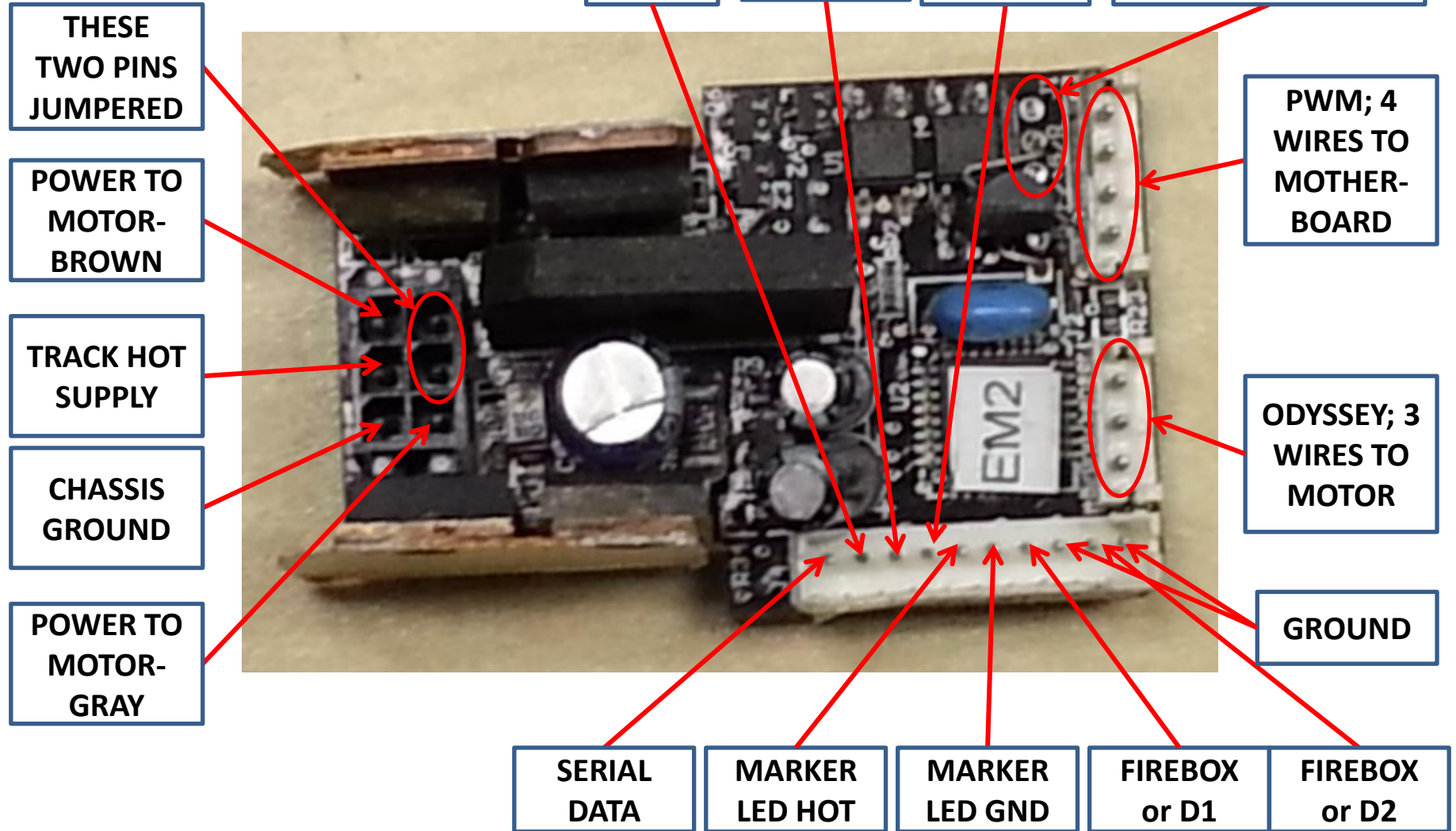
Typical Diesel-Steam MB





# 691-DCDS-EM2

(YU1 and FP6 revs similar)





POWER  
SUPPLY  
BOARD  
HERE

SERIAL  
DATA/GND

RL/RC

RS-SS  
Jumper

SPEAKER

RS  
BOARD  
HERE

VOLUME  
POT  
(Center = Wiper)

AGND/  
NoSND (?)

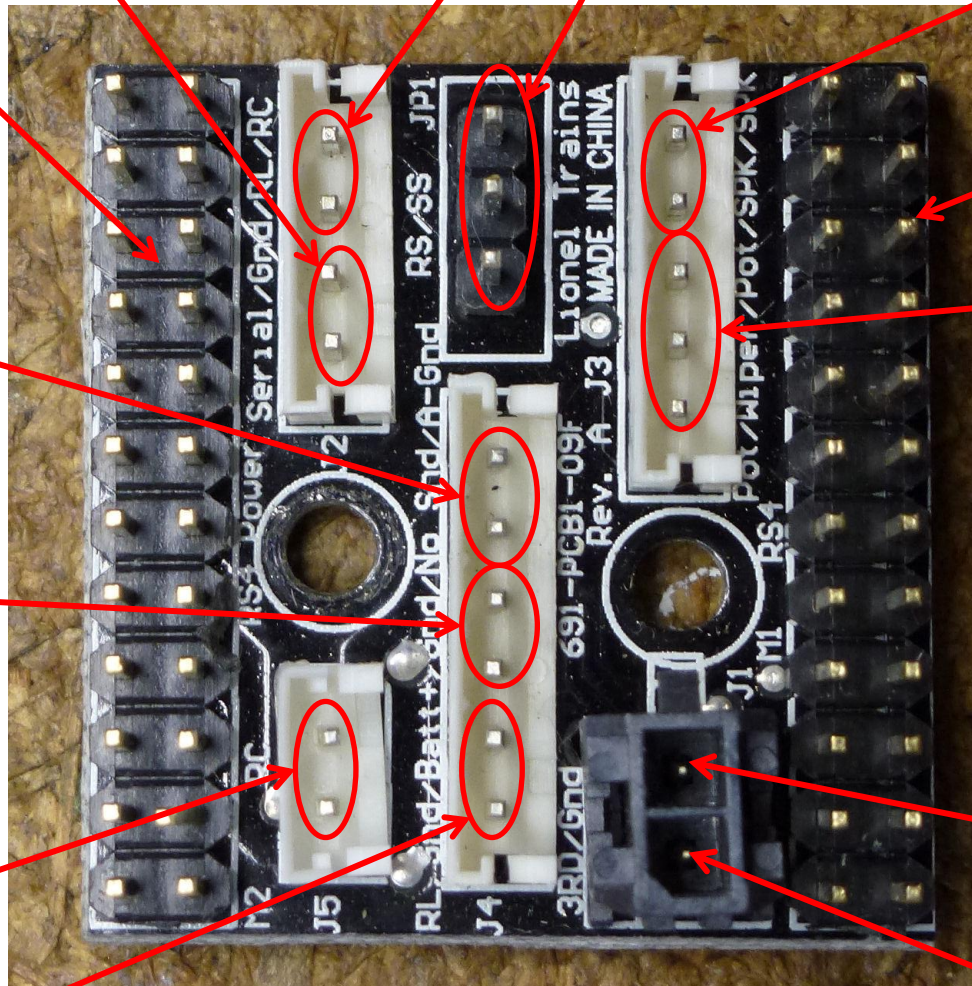
BATTERY  
#4-BLK (-)  
#3-RED (+)

REAR  
COUPLER

RL/Snd ?

CHASSIS  
GROUND

TRACK  
HOT



691-PCB1-09F  
Small Tender MB