

### 4.1.6 Grounding

The grounding point is designed to provide electrical contact between the outer conductor of the elliptical waveguide and the ship's ground.

The waveguide should be grounded along the vertical run near the Antenna Group.

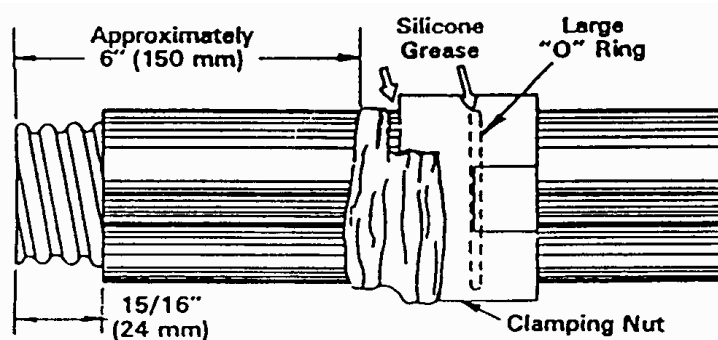
A section of the cable jacket is removed and the ground strap tightly fastened to the outer conductor. The connection is then wrapped in butyl rubber tape and vinyl tape for protection from weather. Finally, a terminal is attached to the ground wire. The terminal should be connected to the ship's ground terminal board.

Do not make bends closer to the grounding point to prevent damage during the hoisting.

## 4.2 Elliptical Waveguide Connectors

**STEP 1** - Prepare waveguide as shown in Figure 1. End of waveguide must be square. Use straight-edged piece of paper wrapped around waveguide downward while cutting to keep copper chips from entering. Remove all burrs from cut and of waveguide using knife and file. Clean exposed copper with solvent. Clean inside of waveguide with bottle brush.

Figure 1:



**STEP 2** - Add thin coating of silicone grease to large "O" ring gasket and place it into groove inside clamping nut, then apply thin coating of silicone grease to smooth inside surface of clamping nut that slides over smaller "O" ring (step 8). Place nut over end of waveguide at distance from end as shown. Secure nut to waveguide with several turns of tape covering end of nut to keep foreign matter from entering during assembly operation.

**STEP 3** - Slip compression ring over waveguide until recessed edge bottoms against jacket. Apply small amount of silicone grease to edge of jacket to aid in installing compression ring. Alignment pin hole openings must face away from waveguide as shown in Figures 2 and 3.

Figure 2:

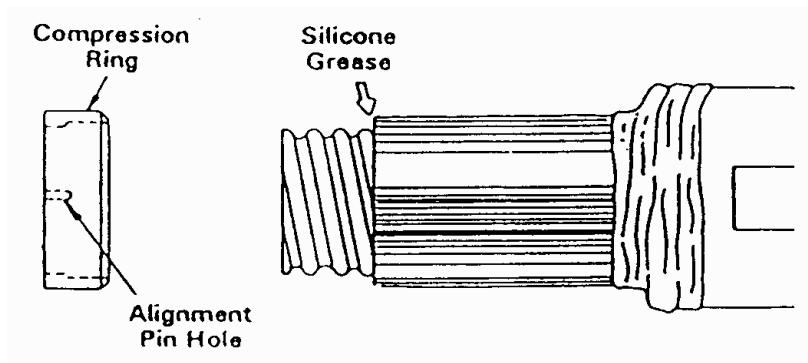
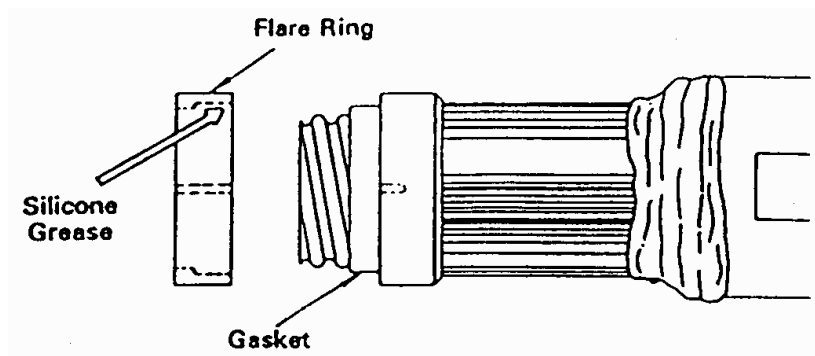


Figure 3:

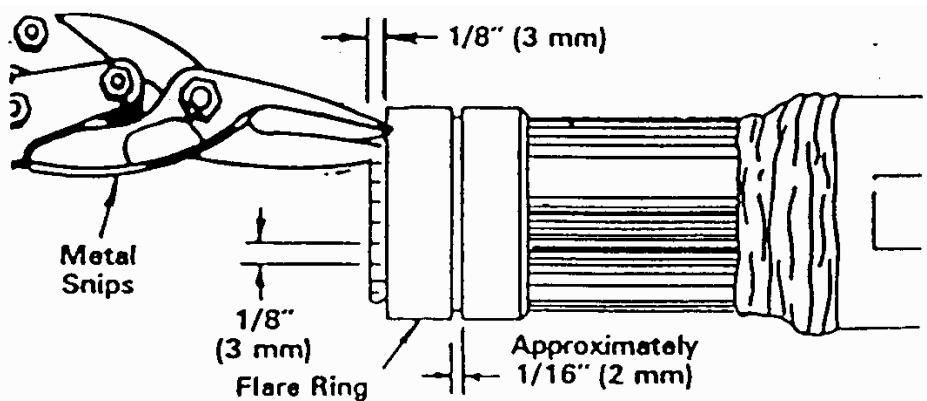


**STEP 4** - Turn gasket inside out and place over end of waveguide. Apply very thin coating of silicone grease to gasket threads, the flip gasket over and against compression ring. Apply thin coating of silicone grease to outside surface of gasket. Refer to Figure 3. Clean any silicone grease from exposed copper using solvent.

**STEP 5** - Slip recessed side of flare ring over gasket. Alignment pin holes in flare ring and compression ring must be in line. Flare ring must be pushed against compression ring as tight as possible. refer to Figure 3 and 4. Approximate opening between flare ring and compression ring should be as shown.

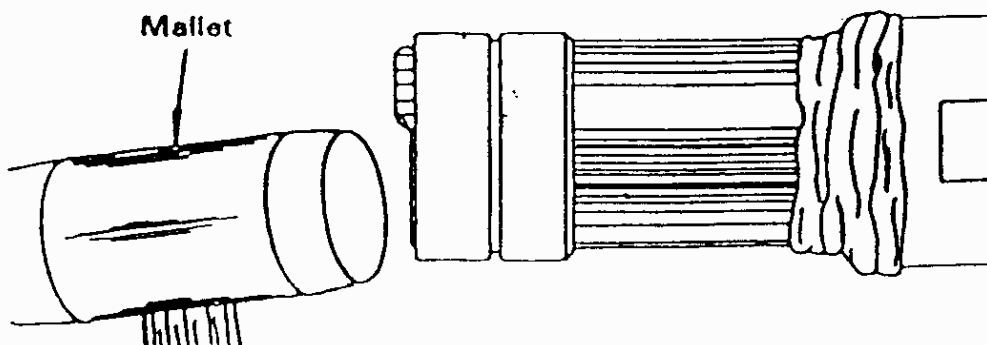
**STEP 6** - Use metal snips to make cuts into end of waveguide to depth and intervals shown to form tabs. See Figure 4. Make cuts as close as possible to flare ring.

Figure 4:



**STEP 7** - Flatten tabs against flare ring. Use mallet as shown figure 5. Use only enough force to flatten tabs. Do not strike tabs so hard as to reduce thickness of metal. Trim any tab that protrudes past outside of groove in flare ring. After tabs are flattened and trimmed, tabs should be cleaned with solvent to remove any silicone grease. Face off connector body with contacts tabs should also be cleaned thoroughly so that no grease is present in mating RF contact surfaces. Clean inside of waveguide with bottle brush.

Figure 5:

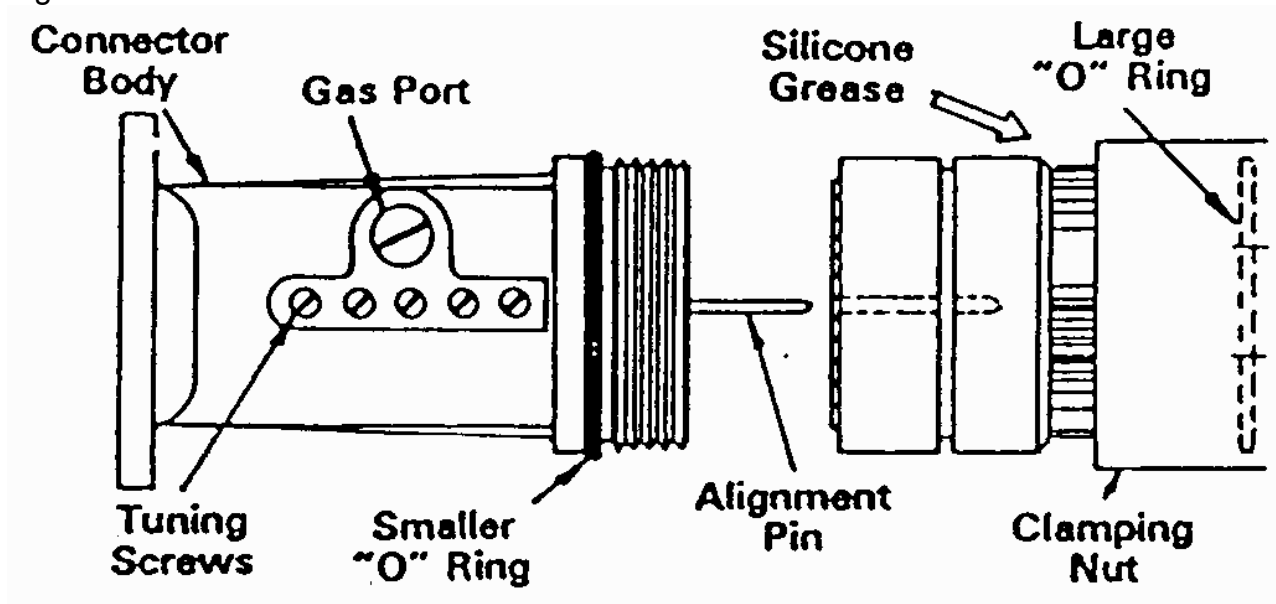


**STEP 8** - Please smaller "O" ring gasket into groove in connector body. Do not apply silicon grease to this gasket. Apply thin coating of silicon grease to rear outer surface of compression ring. This will allow large "O" ring gasket inside clamping nut to slide over compression ring.

**STEP 9** - Refer to figure 6. Place connector body against flare ring. Alignment pins must be properly seated in alignment holes of flare ring and compression ring.

Untape and slide clamping nut over assembled part and screw it onto connector body. Tighten connection with wrenches. Use adjustable wrench on rectangular portion of connector body to hold it in position while clamping nut is tightened. Turn clamping nut only; Do not turn connector body.

Figure 6:



**STEP 10** - Waveguide should be check for leaks whenever connectors are attached, when connector-attached waveguide is received at site, or after installation.

At dependable method is to apply soap solution to cable connector and pneumatic fittings.

When mating two UG type flanges with the gasket grooves, two flange gasket must be used, if flange with gasket groove is mated to flange without groove, use one flange gasket. Two mating EIA type flanges use only one flange gasket. Do not apply silicone grease to flange gaskets.

### 4.3 Wall/roof Feed-thru

These wall/roof feed-thru kits are designed to permit weatherproof path through a roof or wall for elliptical waveguide. Each kit can be mounted to metal, wood or concrete. A kit consists of a rubber boot, two metal flange halves, sealing washers, and an adjustable clamp.

| ELLIPTICAL WAVEGUIDE TYPE NUMBER | KIT NUMBER | ENTRANCE HOLE DIAMETER IN. (MM) | BOLT HOLE CIRCLE IN. (MM) | NO. OF BOLT HOLES | BOOT FLANGE DIAMETER IN. (MM) |
|----------------------------------|------------|---------------------------------|---------------------------|-------------------|-------------------------------|
| EW 85                            | 35849A-3   | 3 (80)                          | 4 (102)                   | 8                 | 5 (127)                       |

**STEP 1** - Cut the entrance hole in the roof or wall to accommodate the cable size. Refer to the chart for the proper dimension.

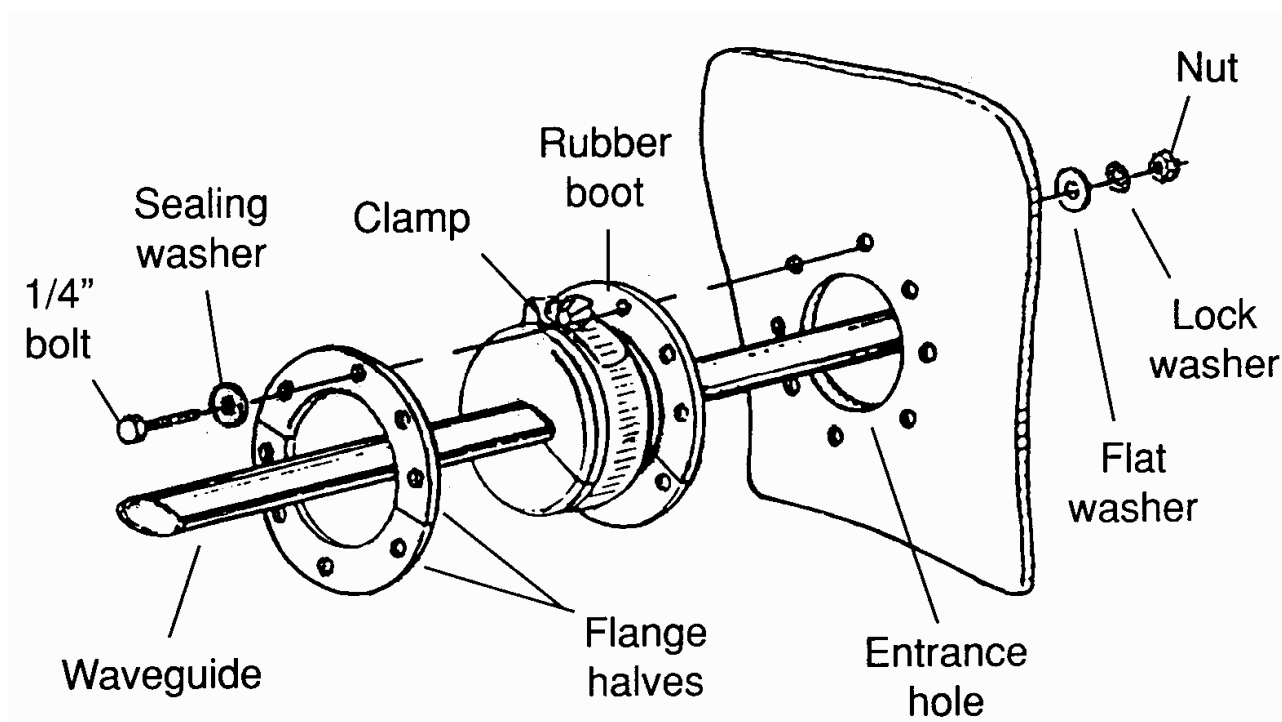
**STEP 2** - Insert the waveguide or cable through the entrance hole and connect it to the entrance hole and connect it to the components inside the building.

**STEP 3** - Apply silicone grease to the hole and slit of the rubber boot. Place the boot on the waveguide or cable and over the entrance hole. Mark the locations of the mounting holes.

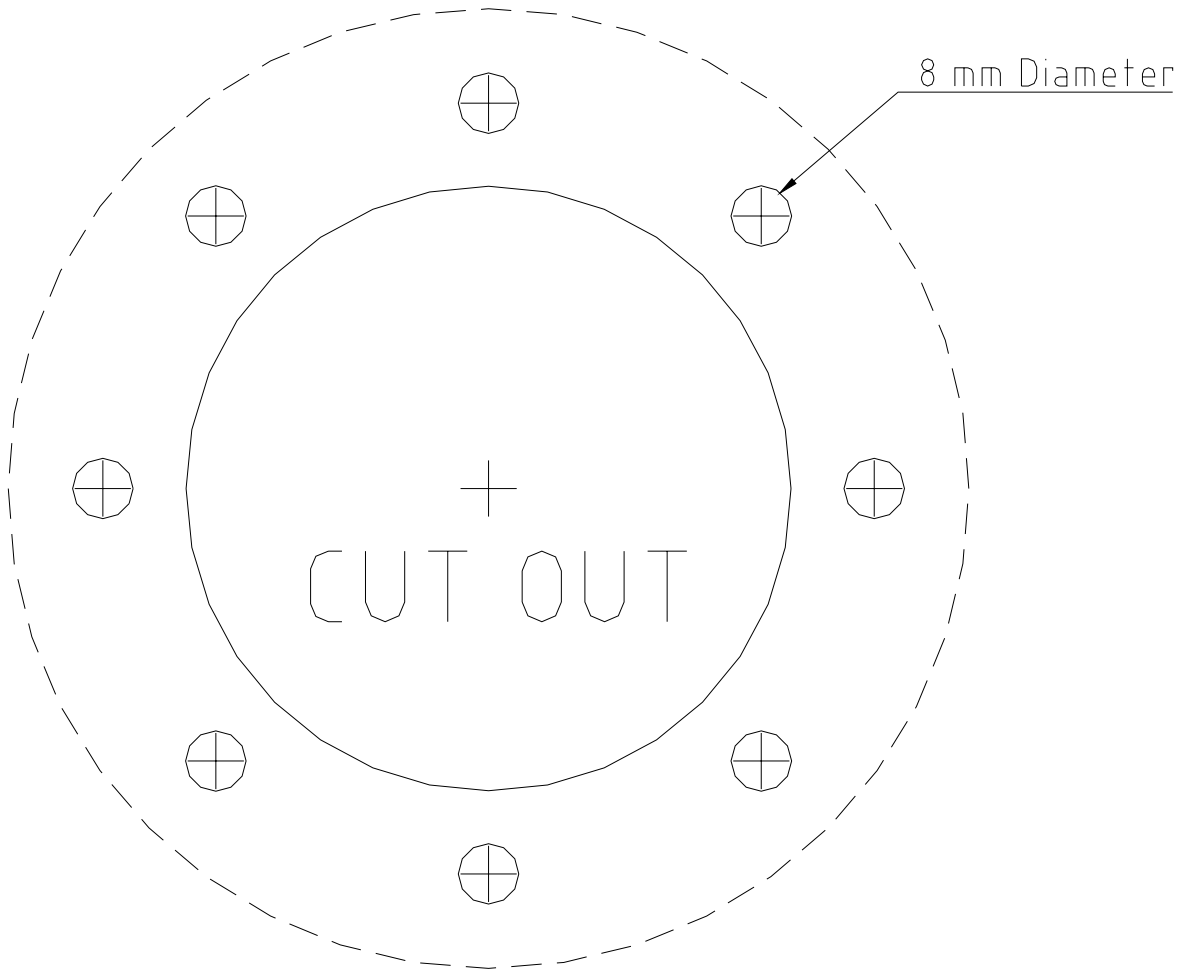
**STEP 4** - Remove the boot and drill the mounting holes 5/16" (8 mm) through the wall or roof. For concrete, either drill holes through the material or drill larger holes deep enough to insert bolt anchors.

**STEP 5** - Place the boot around the waveguide or cable and over the entrance hole. Position the flange halves in the groove of the boot and align all of the mounting holes. Fasten the assembly with 1/4" bolts, flat washers, and nuts obtained locally. Place the sealing washer supplied under the bolt heads as shown.

**STEP 6** - Wrap the clamp around the boot as shown and tighten it with a screwdriver to ensure a leak proof seal.



**FIG. 5.3.2 - WALL FEED THROUGH DRILLING TEMPLATE (Scale 1:1):**

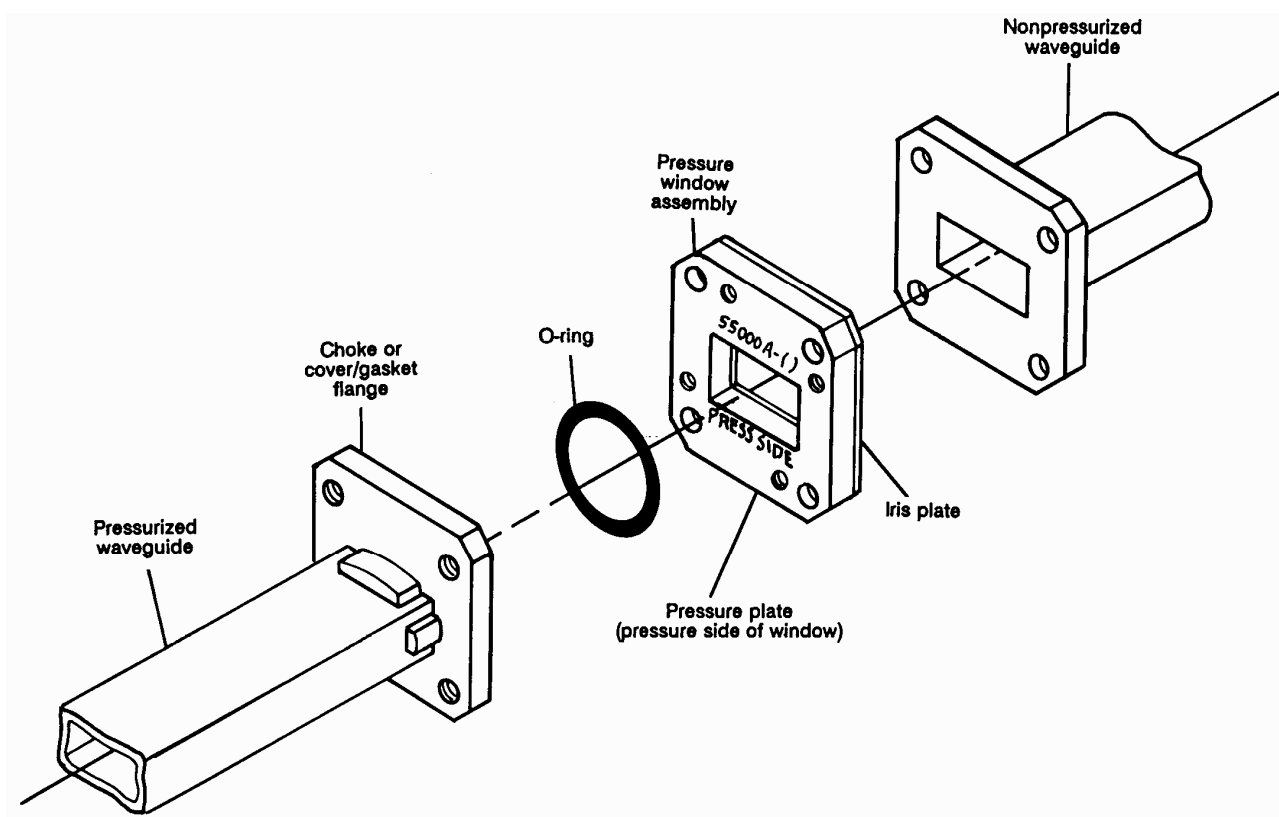


## 4.4 Pressurisation

After all connections have been completed, pressurise waveguide. Changes in temperature can cause moisture from outside air that enters waveguide to condense and seriously impair efficiency, so waveguide must be under pressure at all times.

If moist air has entered, must be purged. Remove gas port plug located on connector at Antenna Group end of waveguide, and purge waveguide continuously until it is dry. After purging, replace gas port plug and pressurise waveguide.

Dry air is normally used for pressurising. Dry nitrogen may also be used. After installation, check waveguide connections for leaks. Use commercial leak detector or liquid detergent over joints and check for bubbles. Un-broken soap film over entire joint for several minutes will indicate very small leaks.



## CHAPTER 9 FIGURES

The following figures and drawings are included after this pages:

*Figure 9.1.1 - SRT 12 KW - General View*

*Figure 9.1.2 - SRT 12 KW – External view*

*Figure 9.1.3 - Pedestal External View*

*Figure 9.1.4 - Pedestal Internal View*

*Figure 9.1.5 - Motoreducer assy*

*Figure 9.1.6 - Electronics Rack*

*Figure 9.1.7 - SRT Functional Block Diagram for 6' Antenna*

*Figure 9.1.8 - SRT Internal Connection*

*Figure 9.1.9 - SRT Internal voltage and signals*

*Figure 9.1.10 - SRT\_POWER - Board*

*Figure 9.1.11 - SRT\_POWER – General block*

*Figure 9.1.12 - SRT\_POWER – Protection circuits*

*Figure 9.1.13 - SRT\_POWER – LVPS circuits*

*Figure 9.1.14 - SRT\_POWER – HVPS circuits*

*Figure 9.1.15 - SRT\_MOS – Board*

*Figure 9.1.16 - SRT\_MOS – Block diagram*

*Figure 9.1.17 - SRT\_CONTROL Board (Version A and B)*

*Figure 9.1.18 - SRT\_CONTROL – Blocks*

*Figure 9.1.19 - SRT\_CONTROL – Microprocessor and Gate Array*

*Figure 9.1.20 - SRT\_CONTROL – Input interface*



*Figure 9.1.21 - SRT\_CONTROL – Output interface*

*Figure 9.1.22 - SRT\_CONTROL – Monitor*

*Figure 9.1.3 - SRT RF HEAD – Functional block diagram*

*Figure 9.1.24 - SRT RF HEAD – L.N.F.E.*

*Figure 9.1.25 - SRT RF HEAD – RF Detector*

*Figure 9.1.26 - BRUSHLESS CONTROLLER – Functional blocks*

*Figure 9.1.27 - Electronics Rack – Particular of the RF Head*

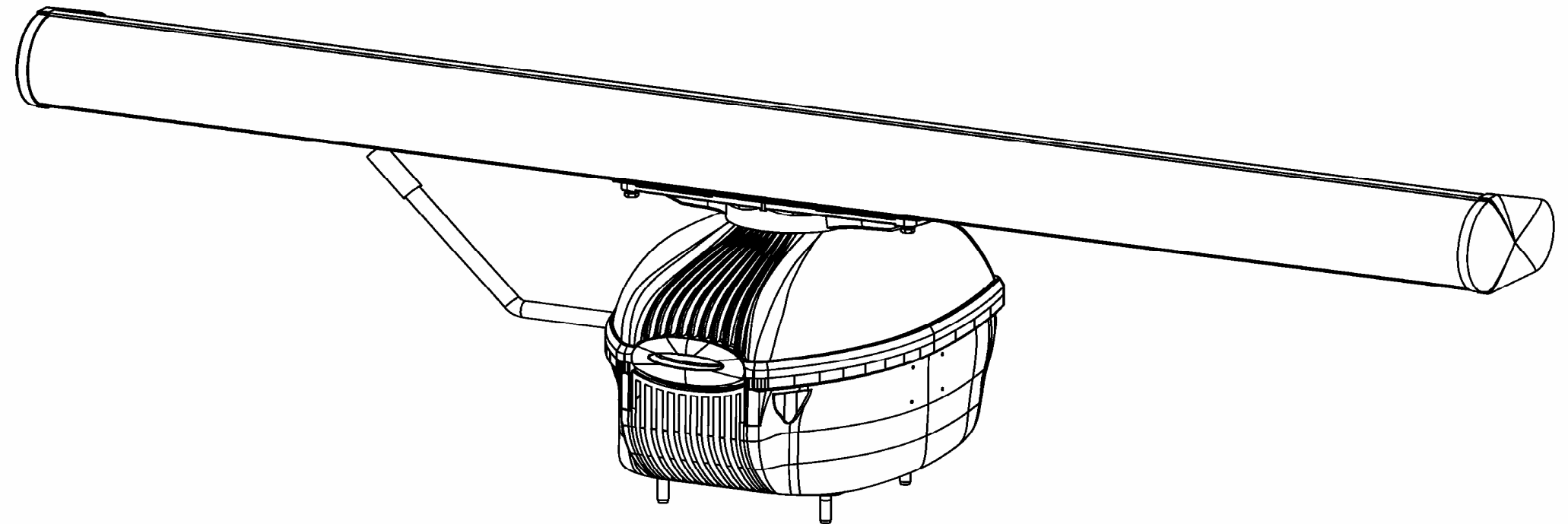
*Figure 9.1.28 - RF Amplifier*

*Figure 9.1.29 - Electronics rack*

*Figure 9.1.30 - Bearing reader board*

*Figure 9.1.31 - Rotary joint*

*Figure 9.1.32 - Brushless Motor Controller*



**Figure 9.1.1 SRT Up mast General View**

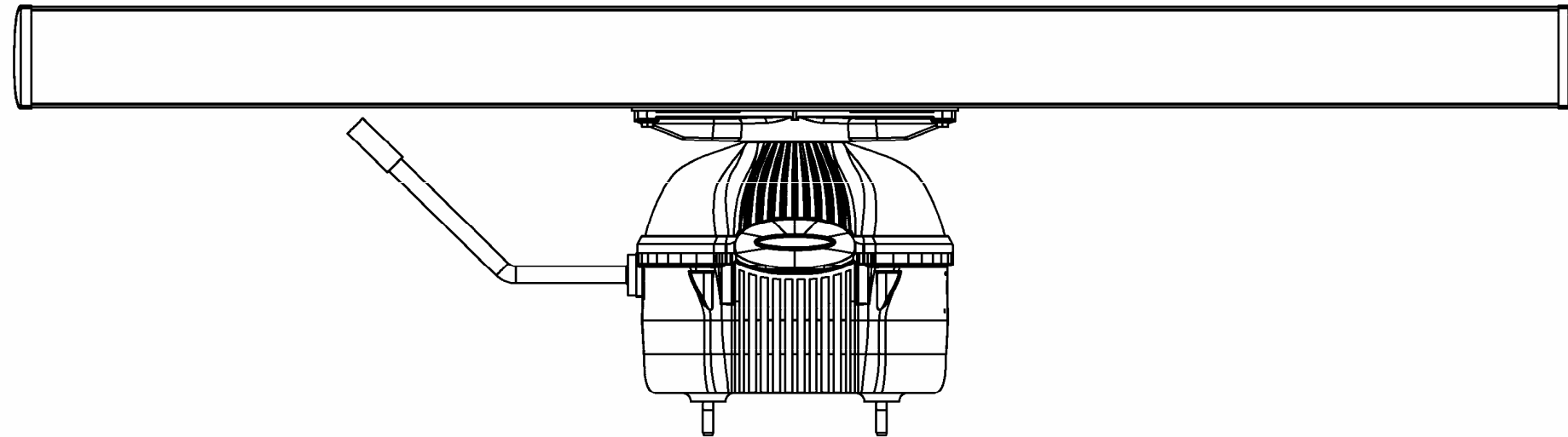


Figure 9.1.2 SRT Up mast– External view

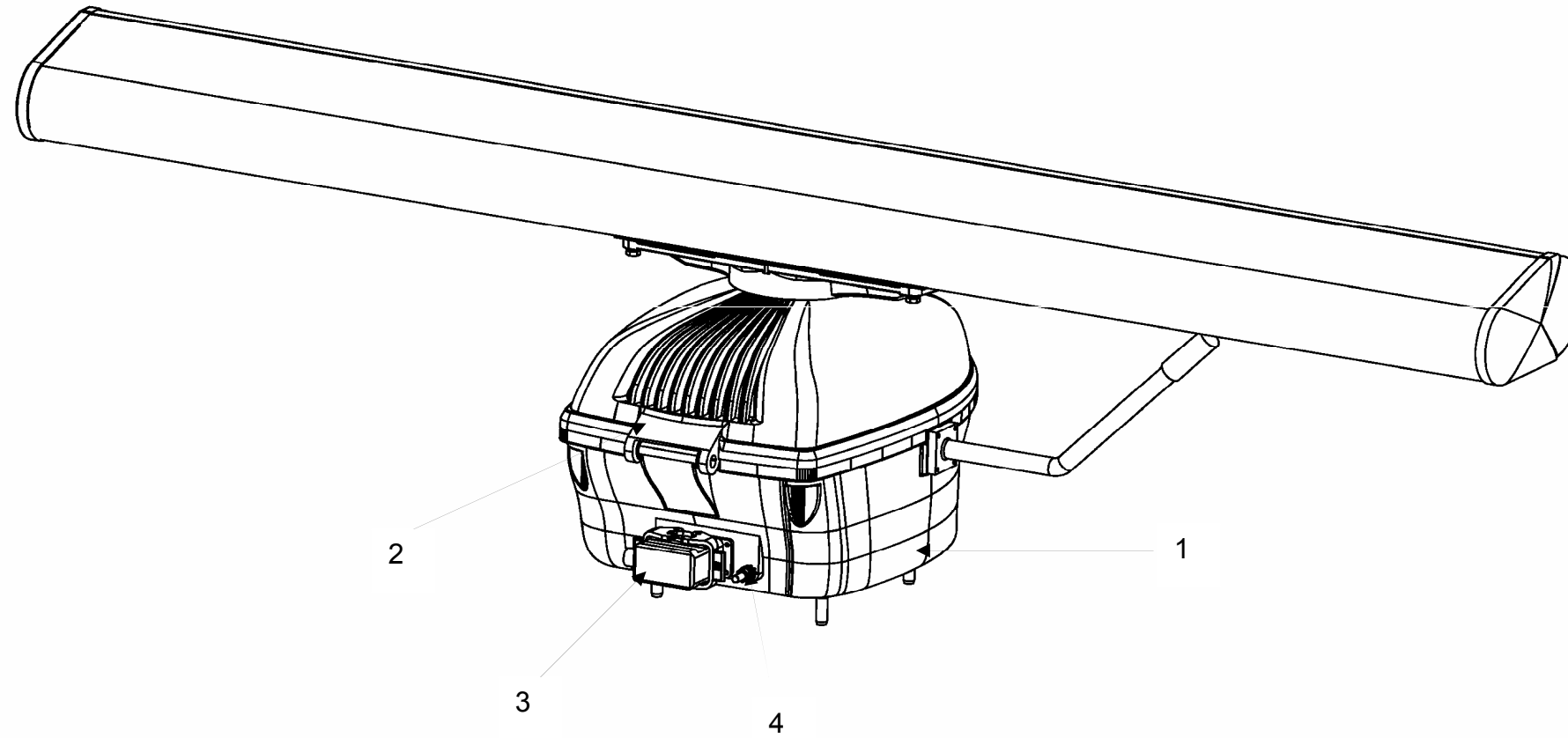


Figure 9.1.3 Pedestal External View

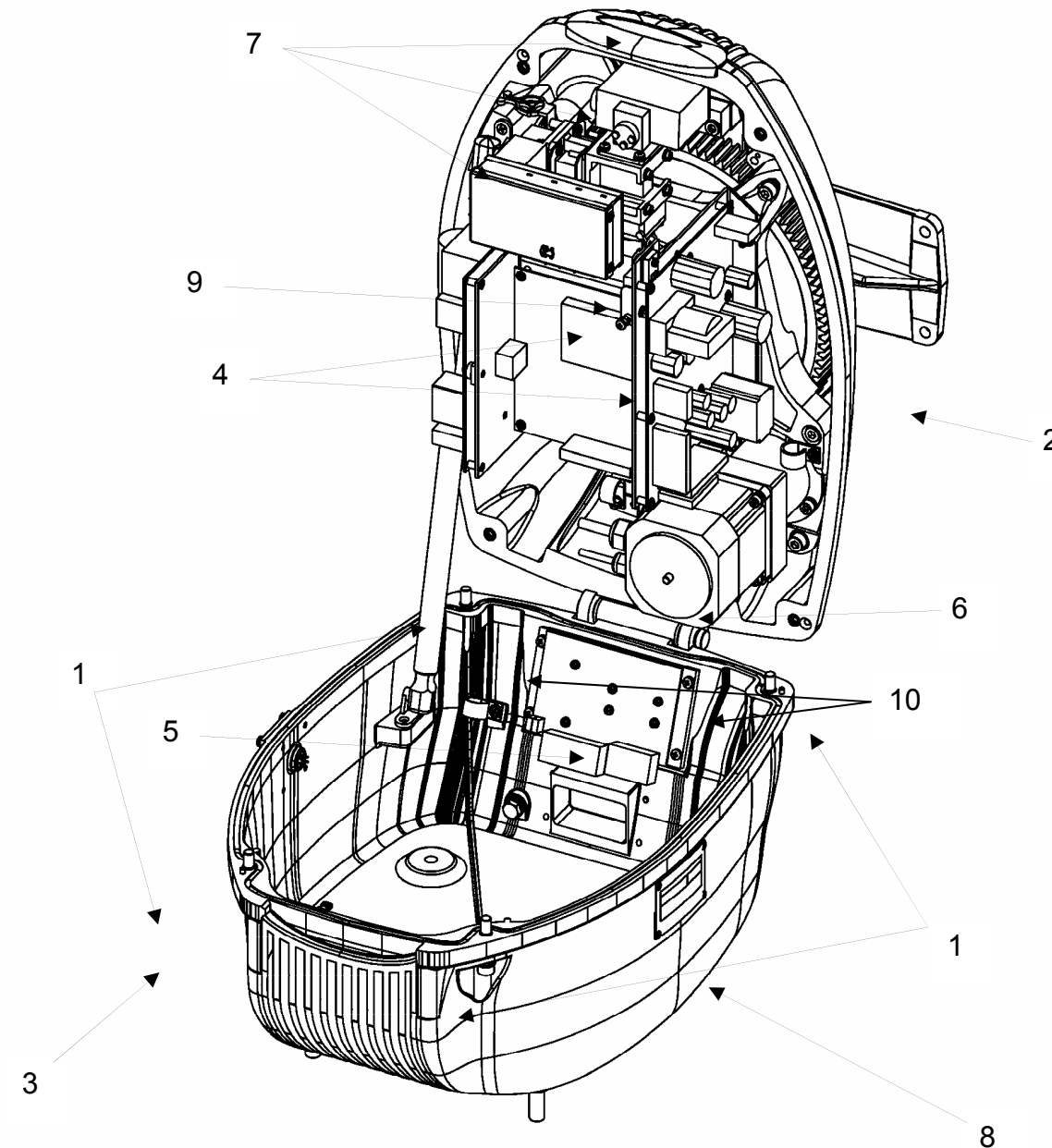


Figure 9.1.4 Pedestal Internal View

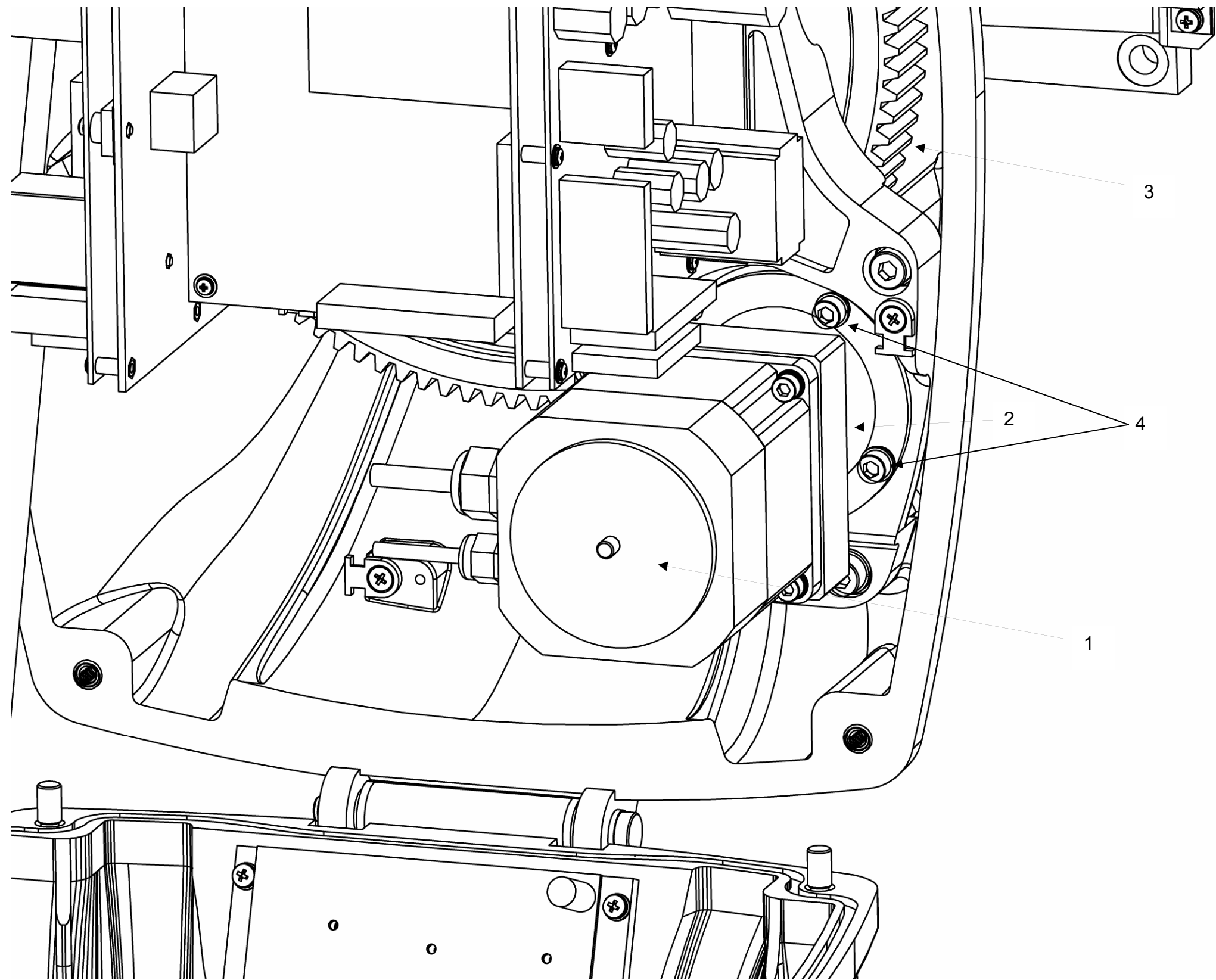


Figure 9.1.5 Motoreducer assy

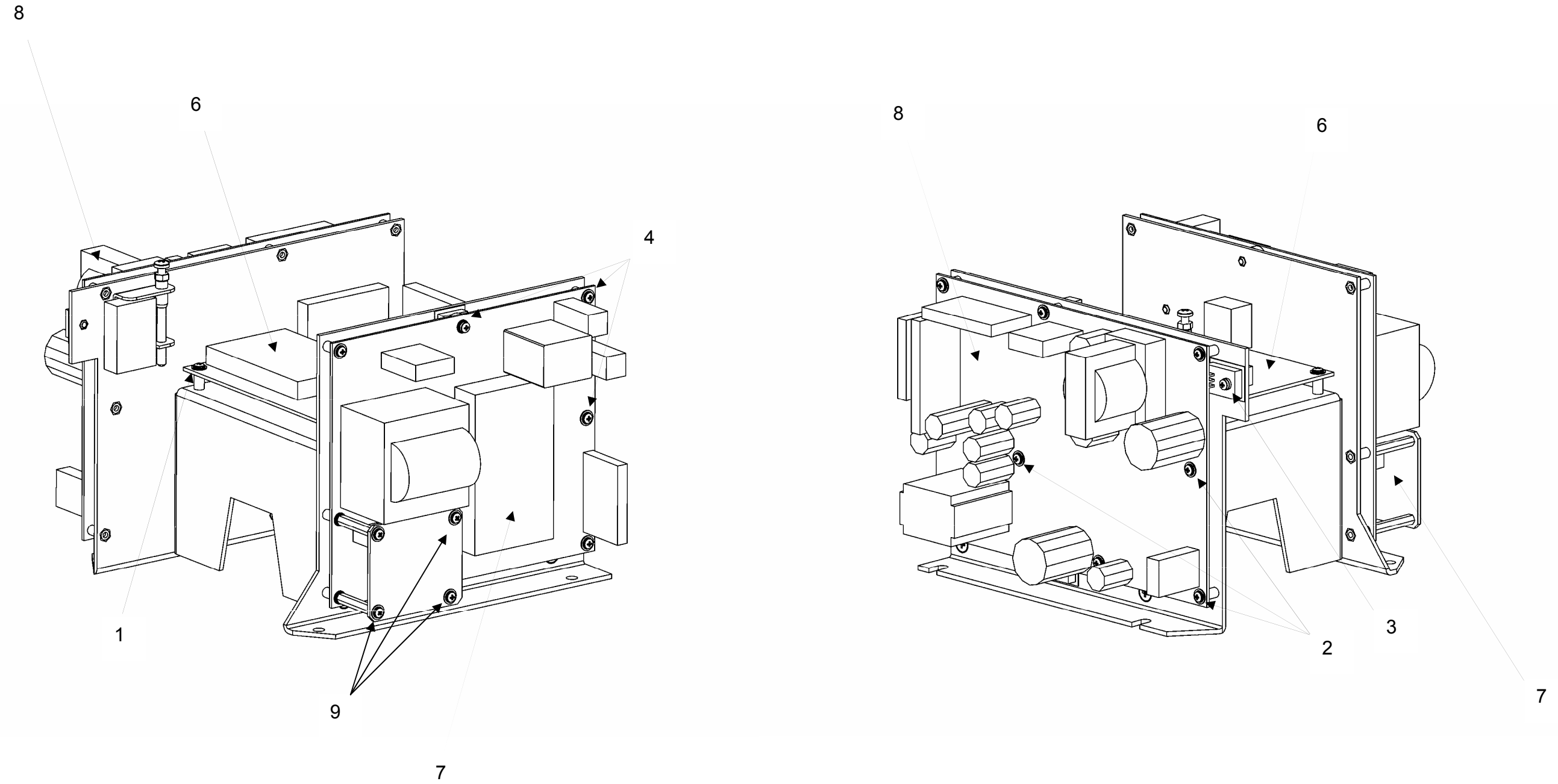


Figure 9.1.6 Electronics Rack

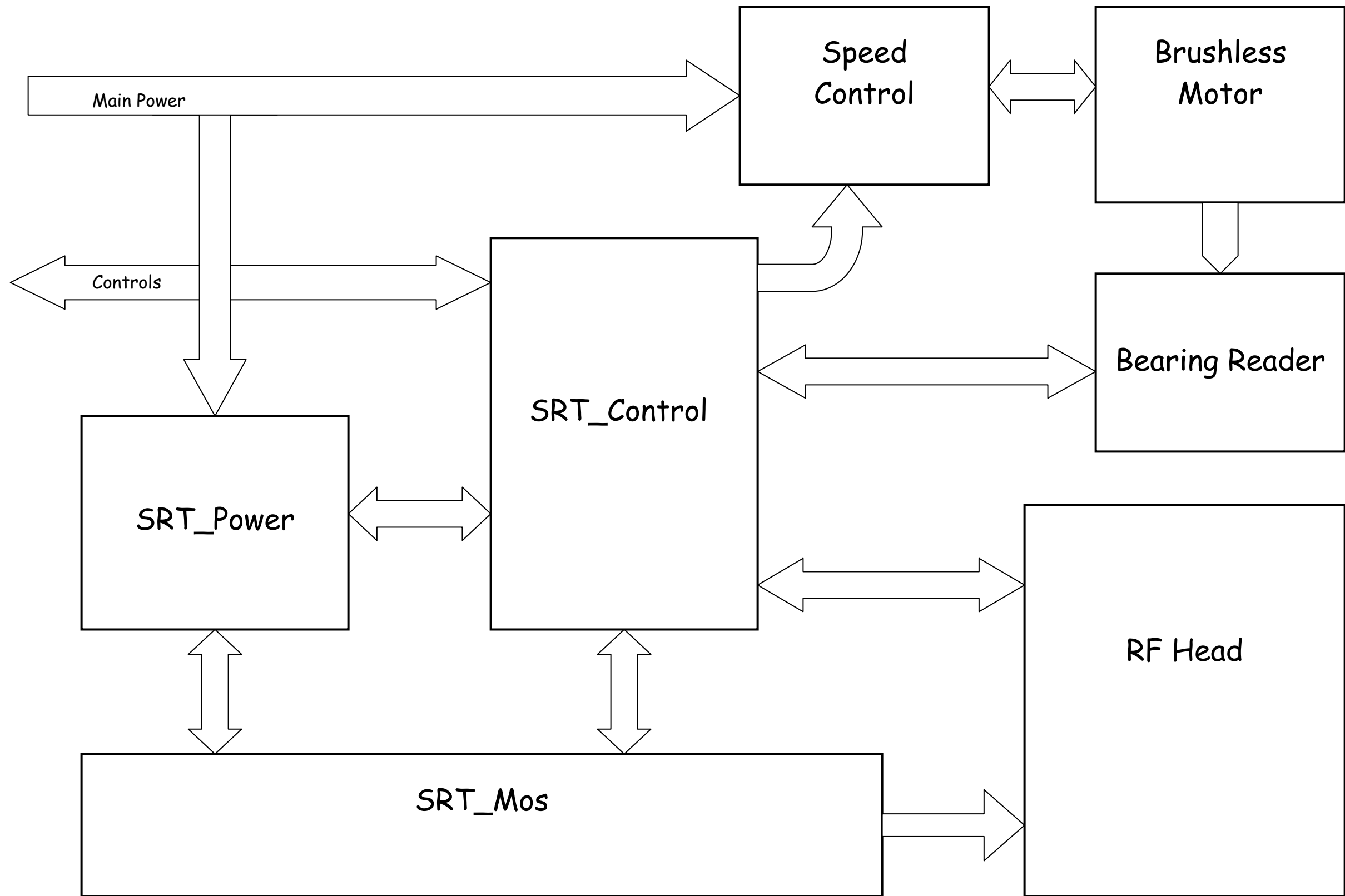


Figure 9.1.7 SRT Functional Block Diagram for 6' Antenna



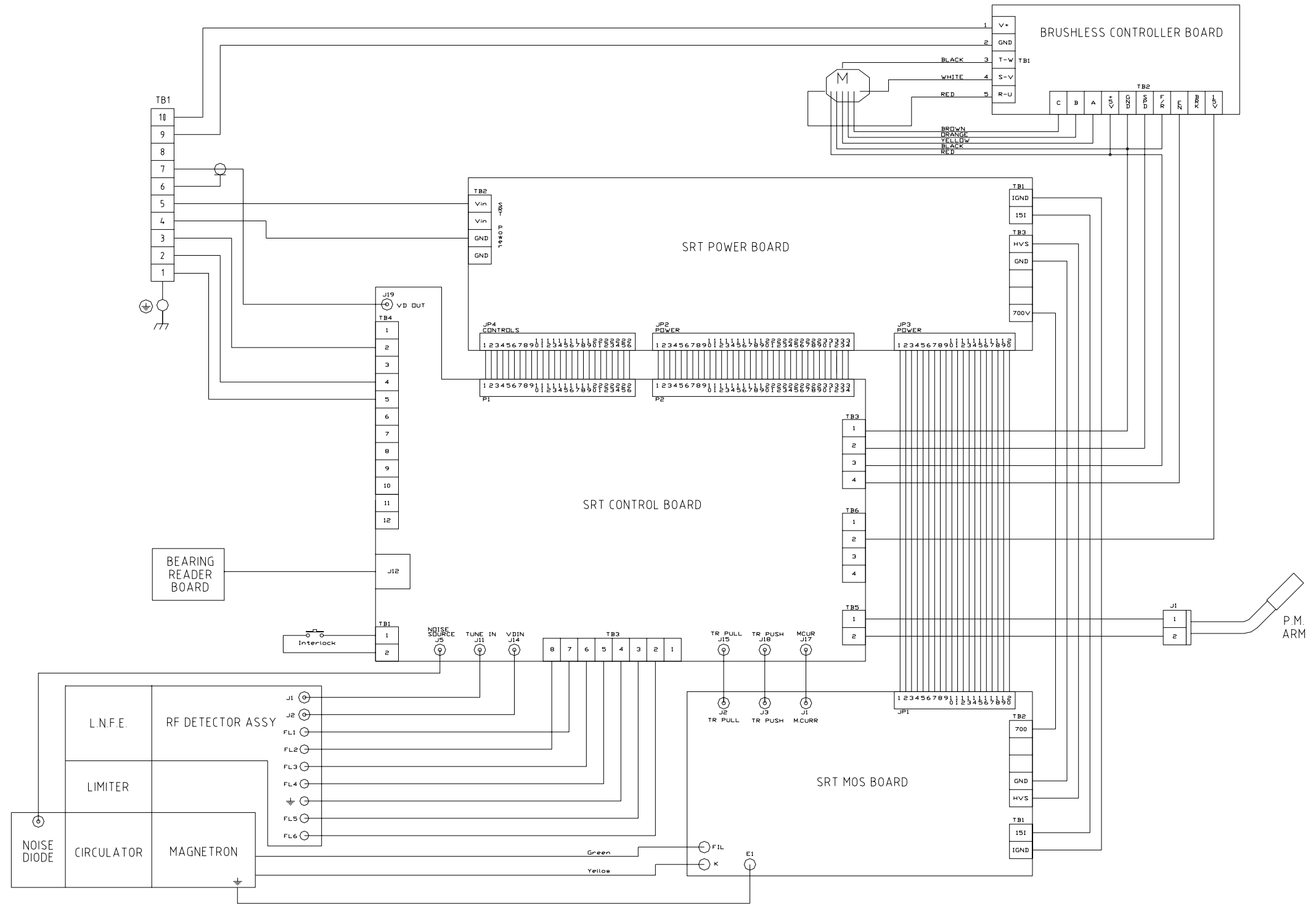


Figure 9.1.8 SRT Internal Connection

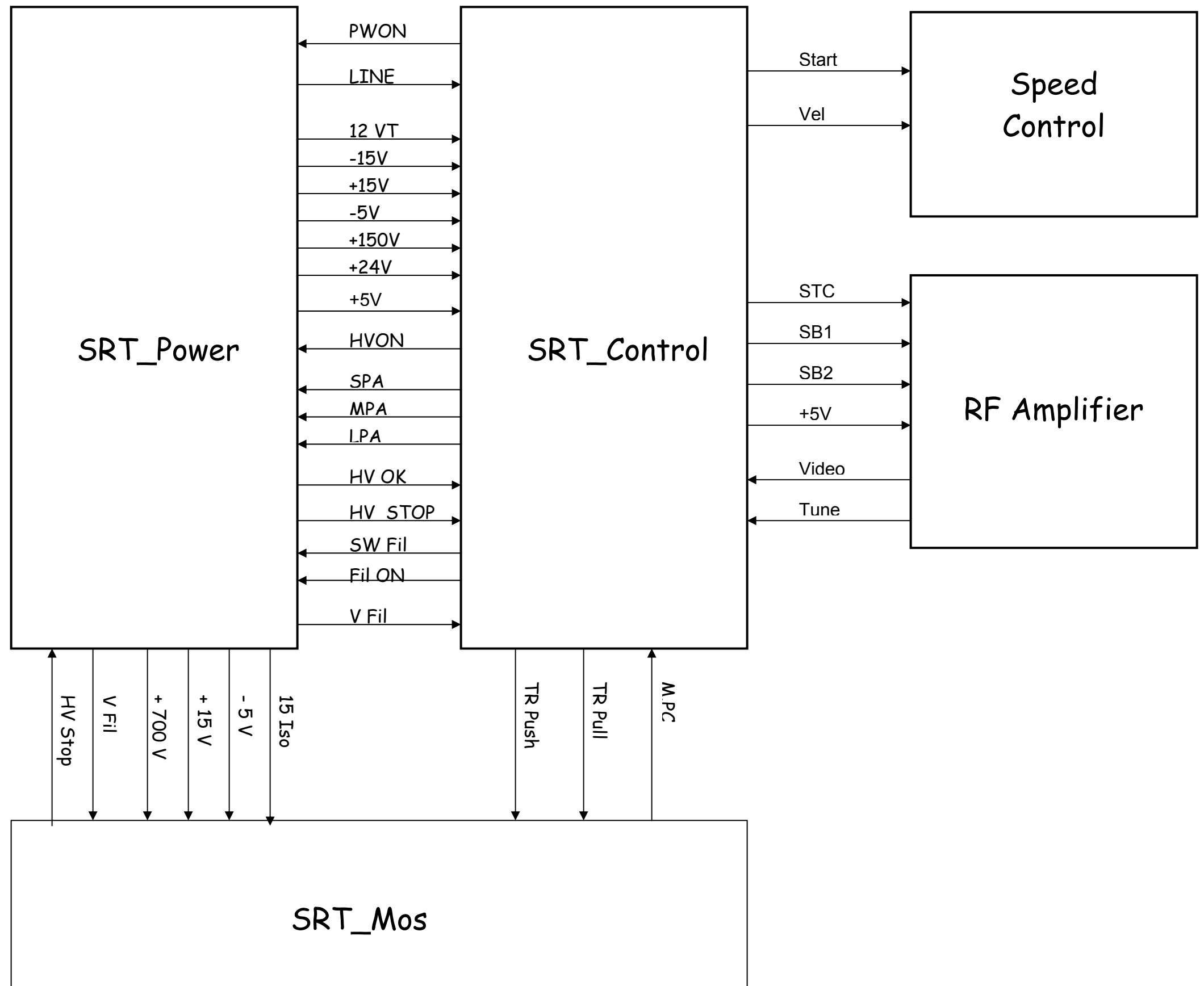


Figure 9.1.9 SRT Internal voltage and signals

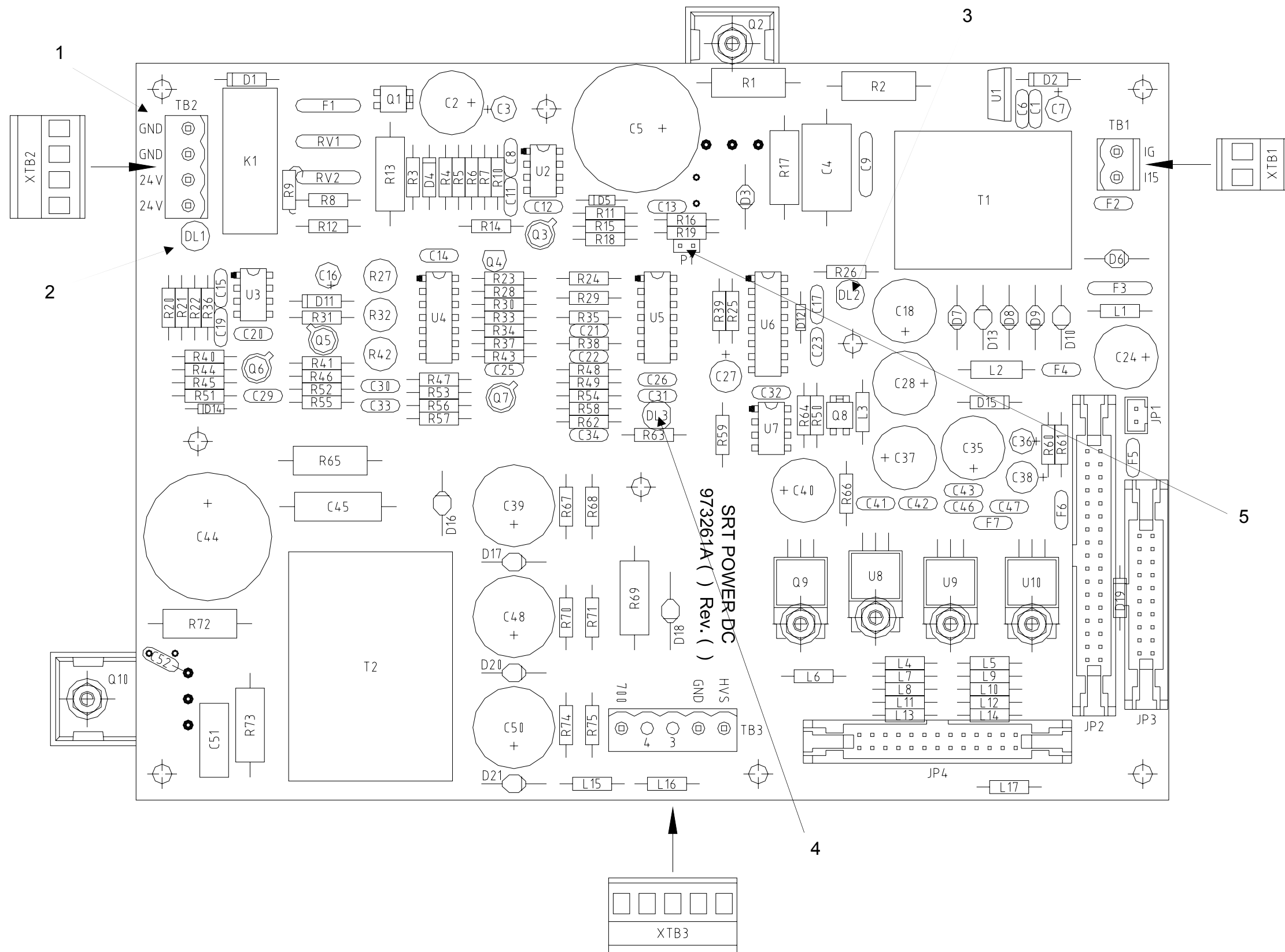
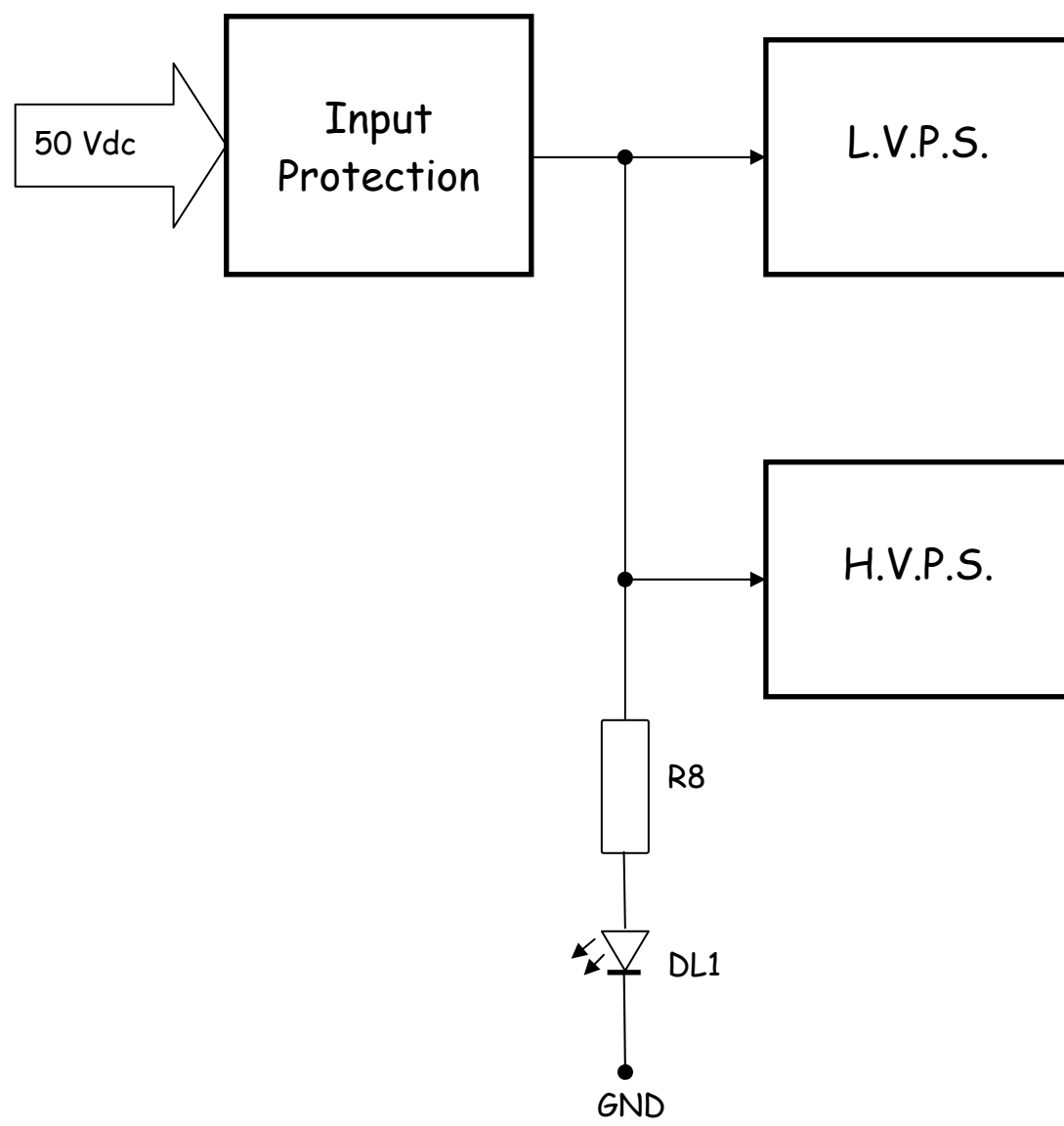


Figure 9.1.10 SRT\_POWER - Board

SRT X-BAND RADAR SYSTEMS  
FIGURES

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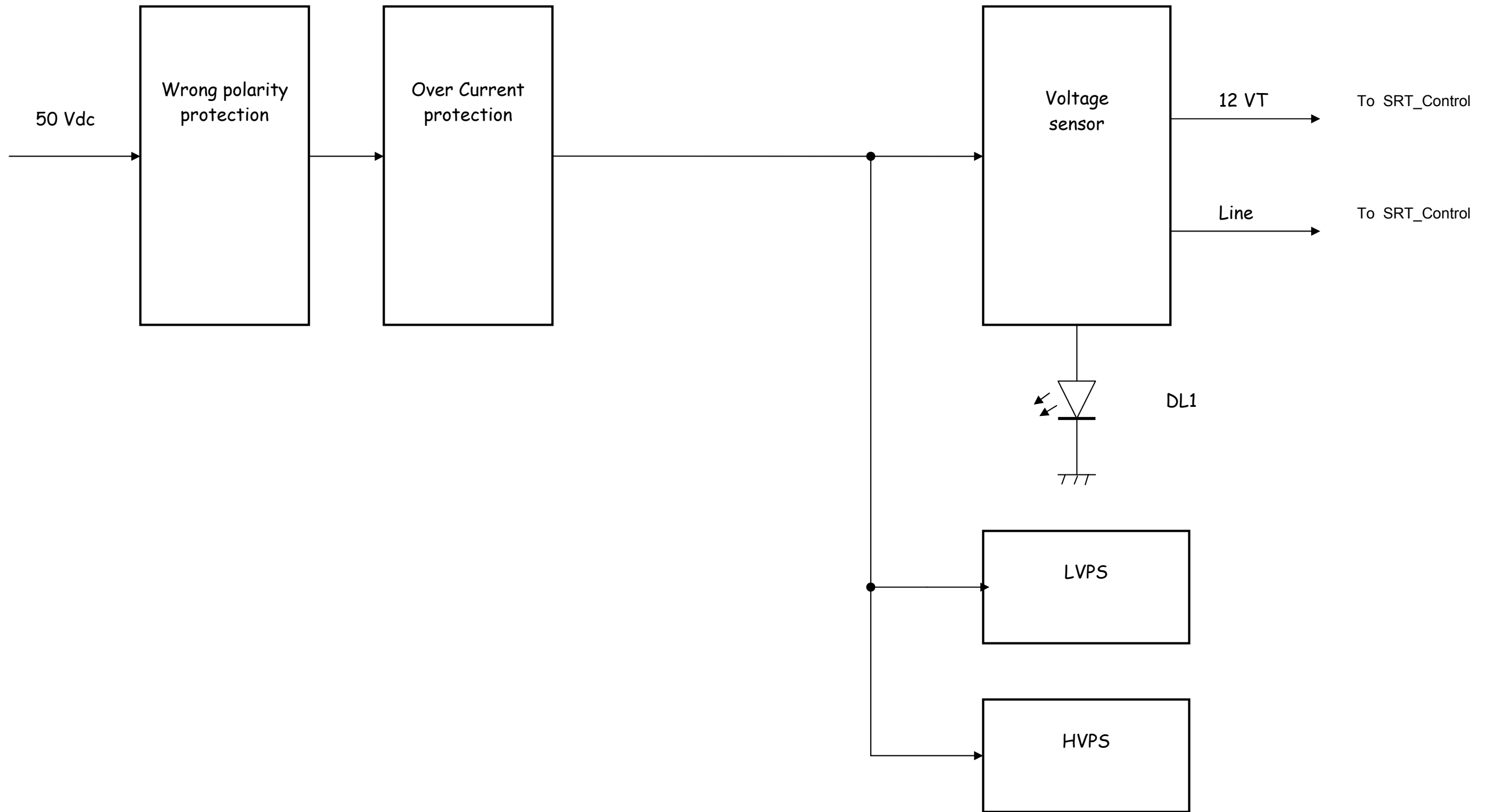


Figure 9.1.12 SRT\_POWER – Protection circuits

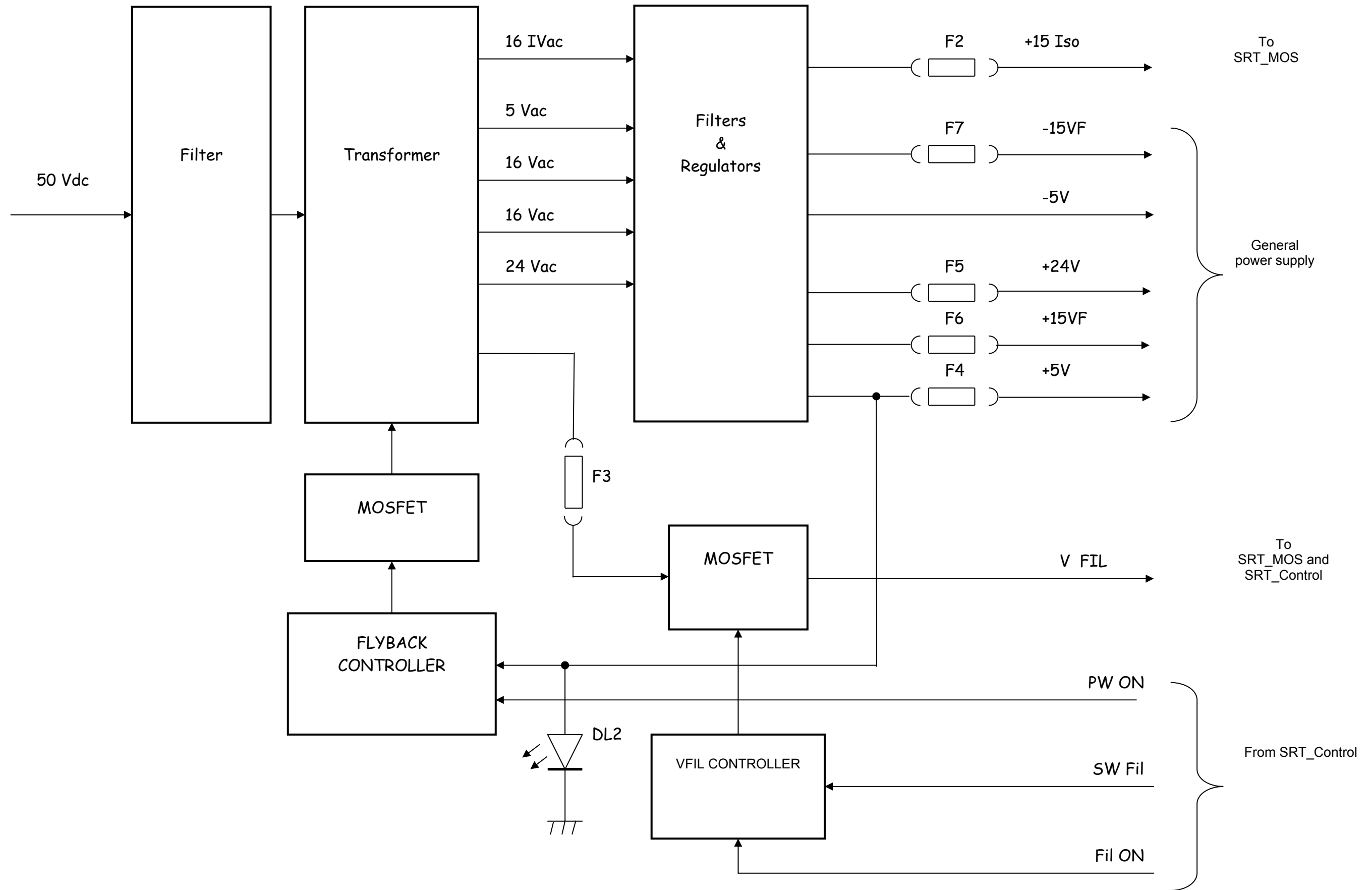


Figure 9.1.13 SRT\_POWER - LVPS circuits

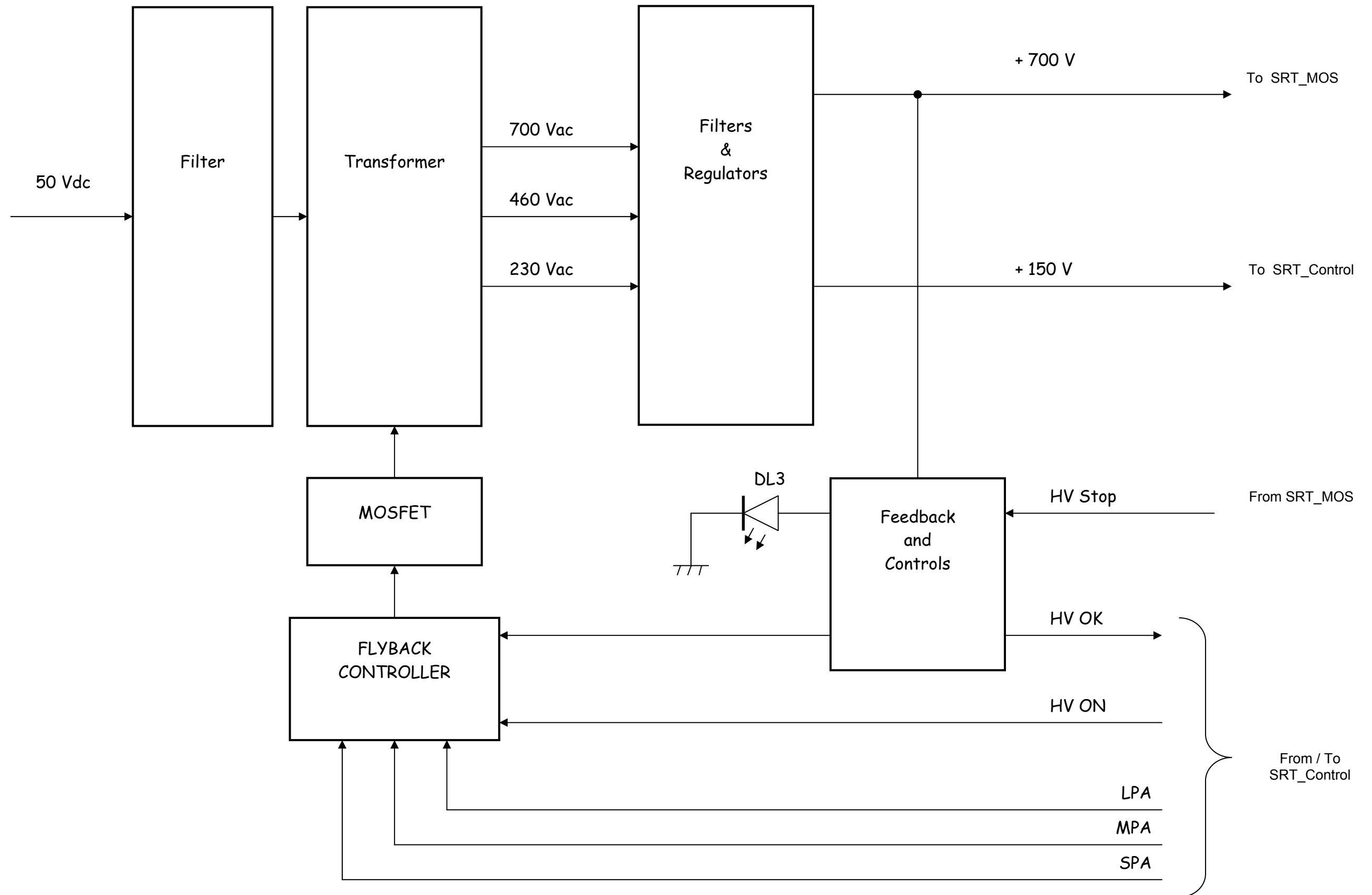


Figure 9.1.14 SRT\_POWER – HVPS circuits

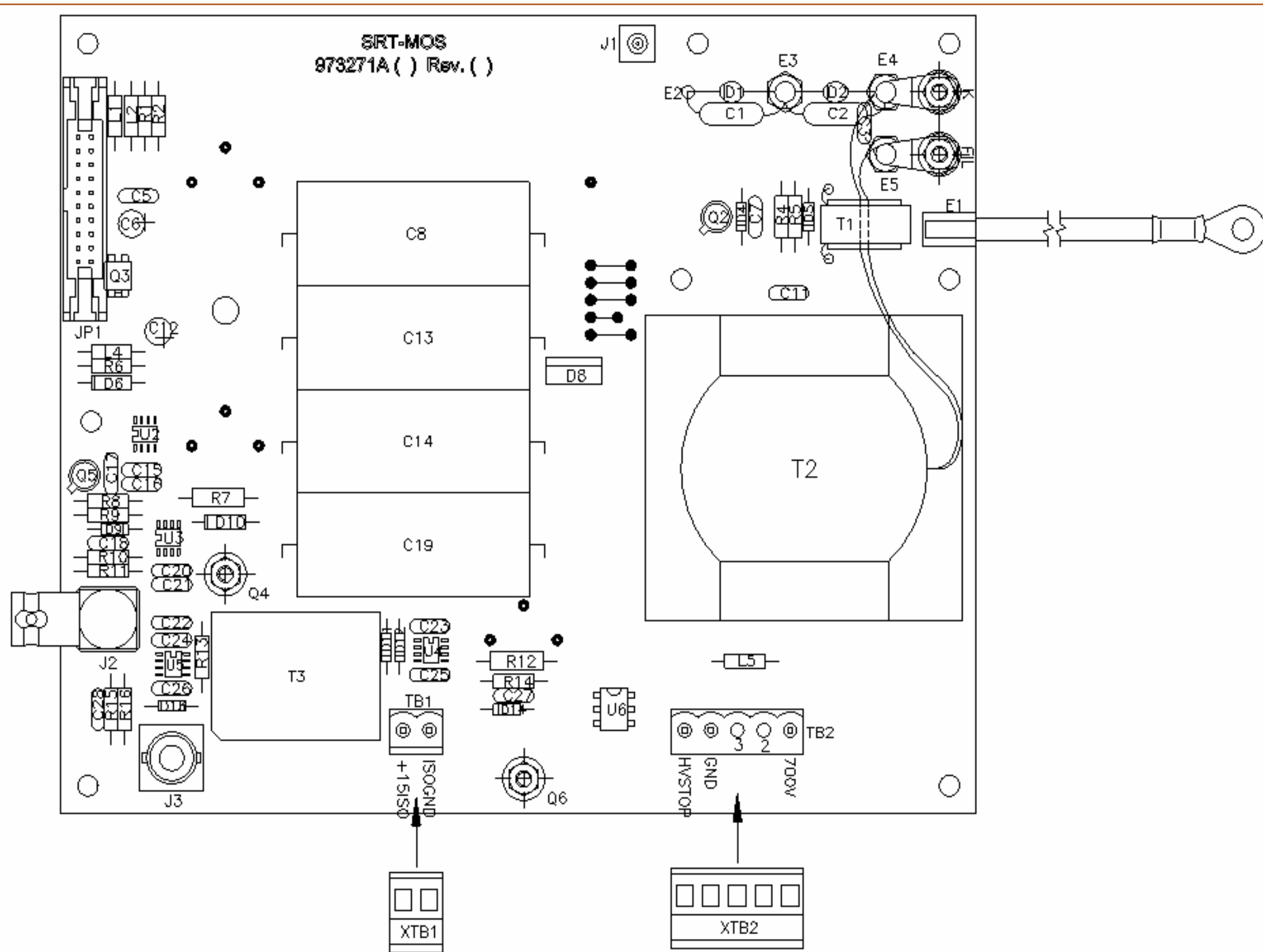


Figure 9.1.15 SRT\_MOS – Board



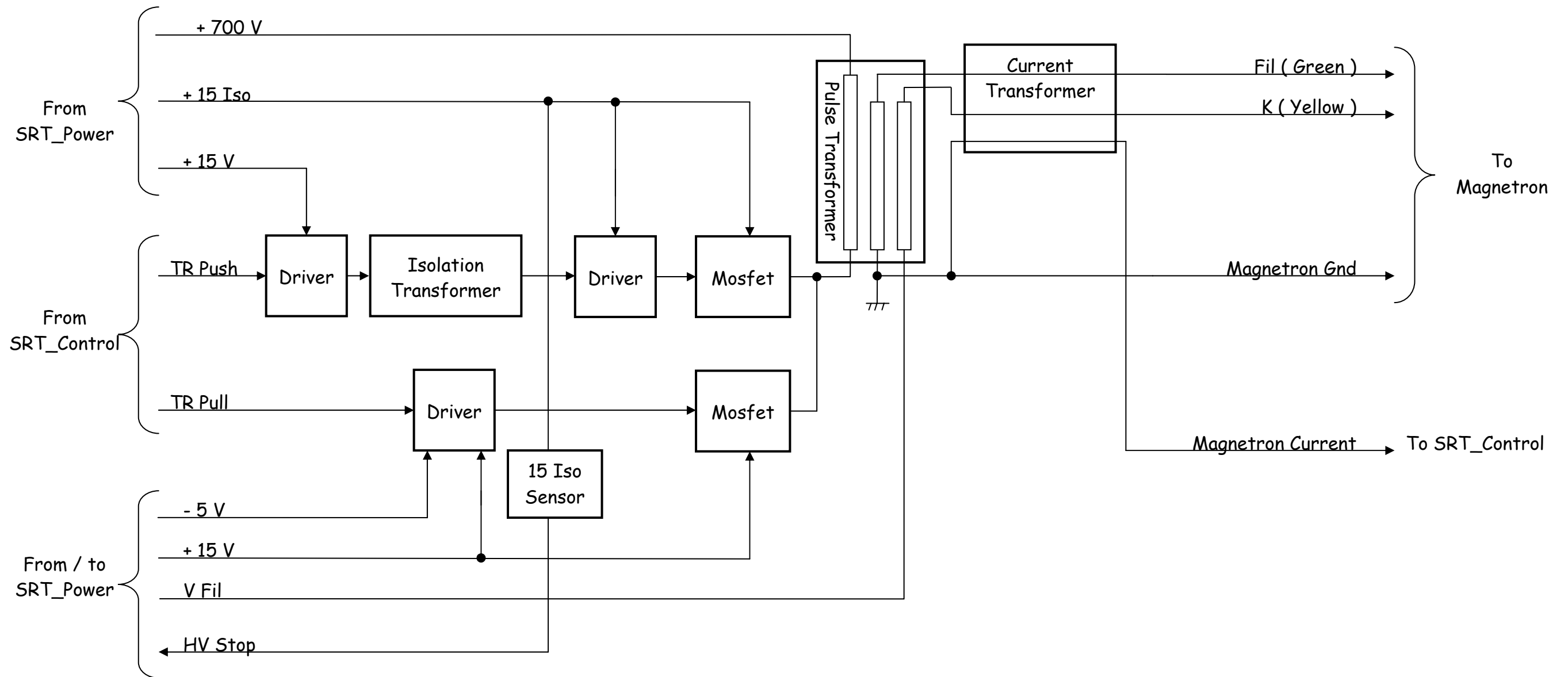


Figure 9.1.16 SRT\_MOS – Block diagram

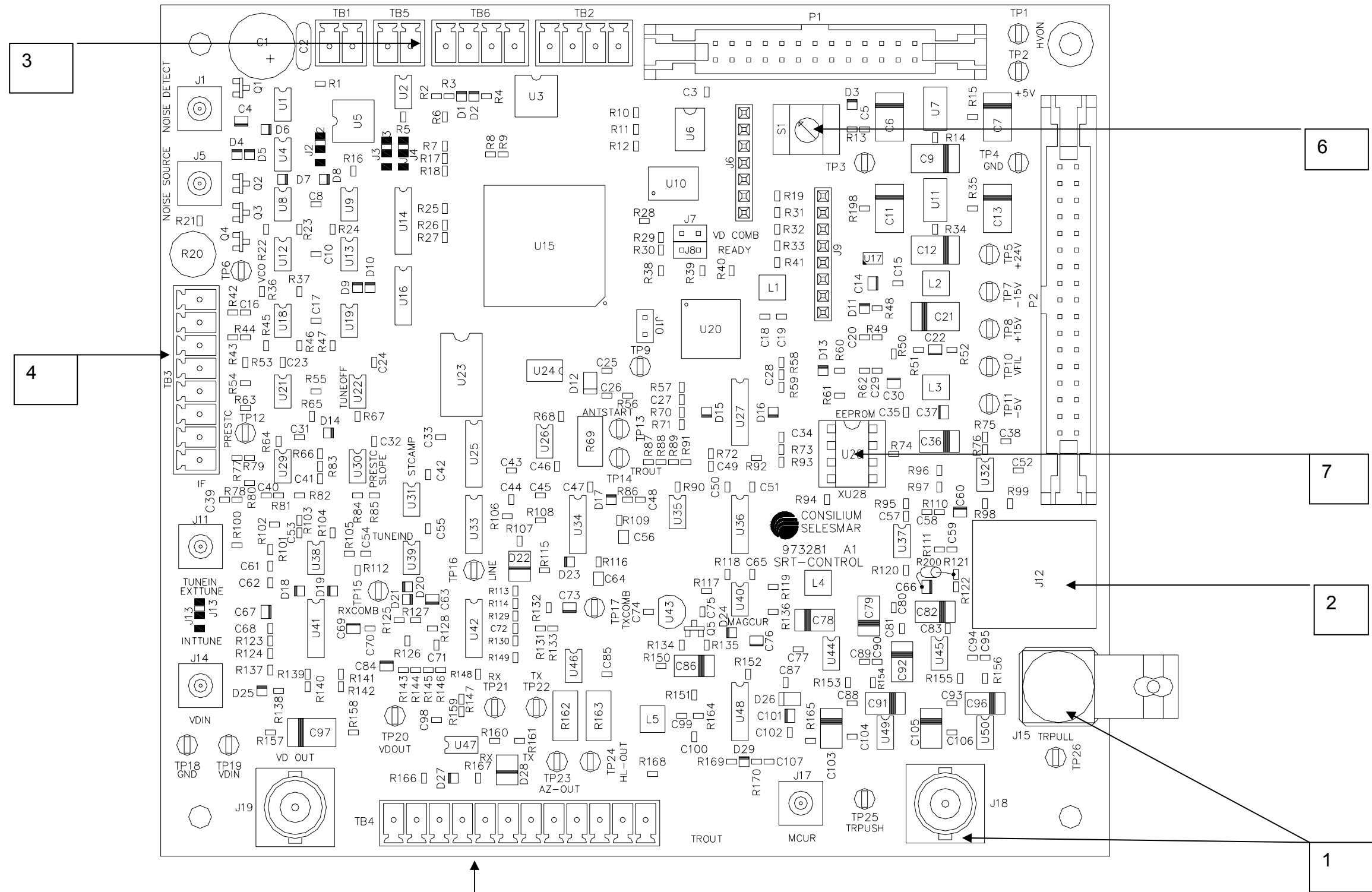


Figure 9.1.17 SRT\_CONTROL Board

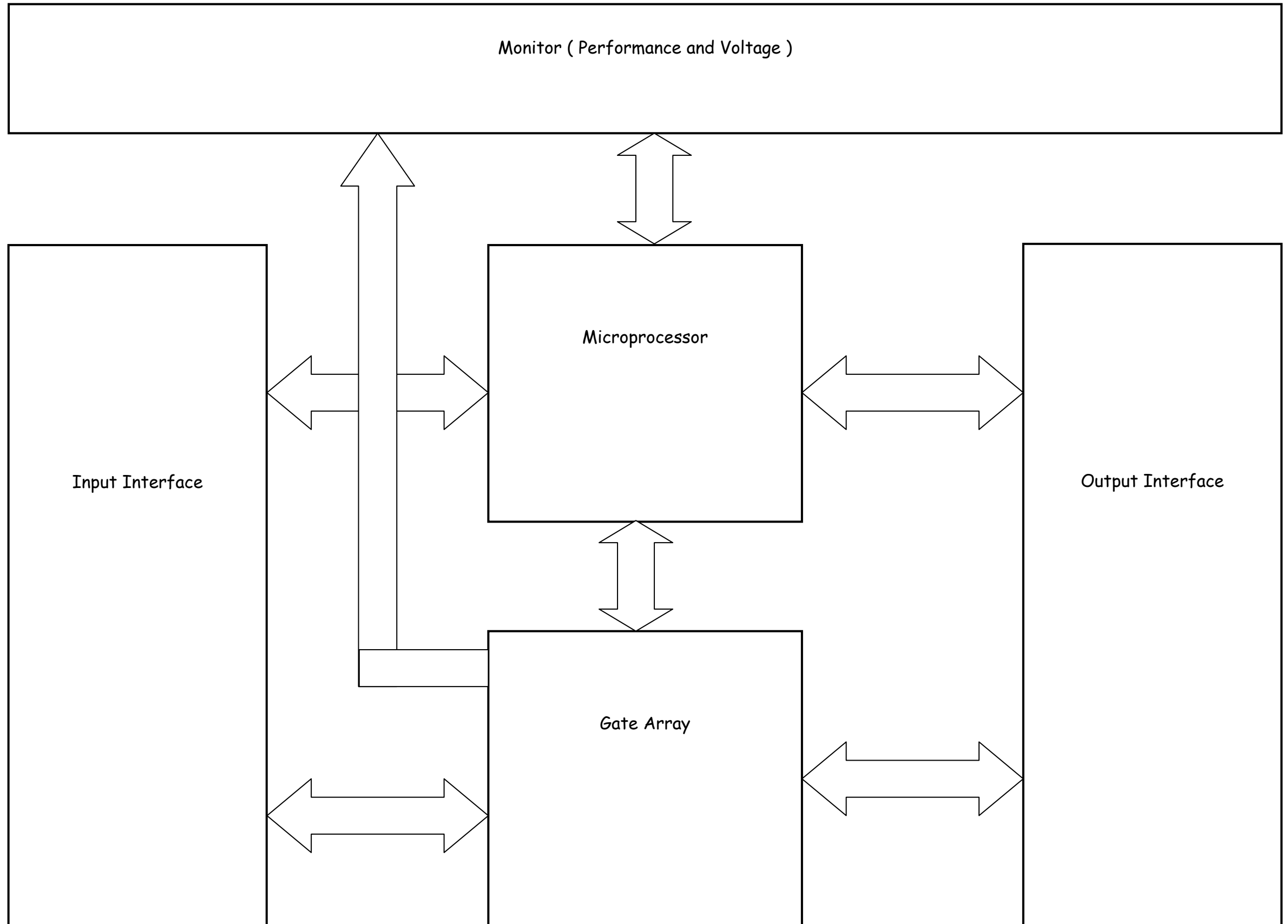


Figure 9.1.18 SRT\_CONTROL – Blocks

Figure 9.1.19 SRT\_CONTROL – Microprocessor and Gate Array

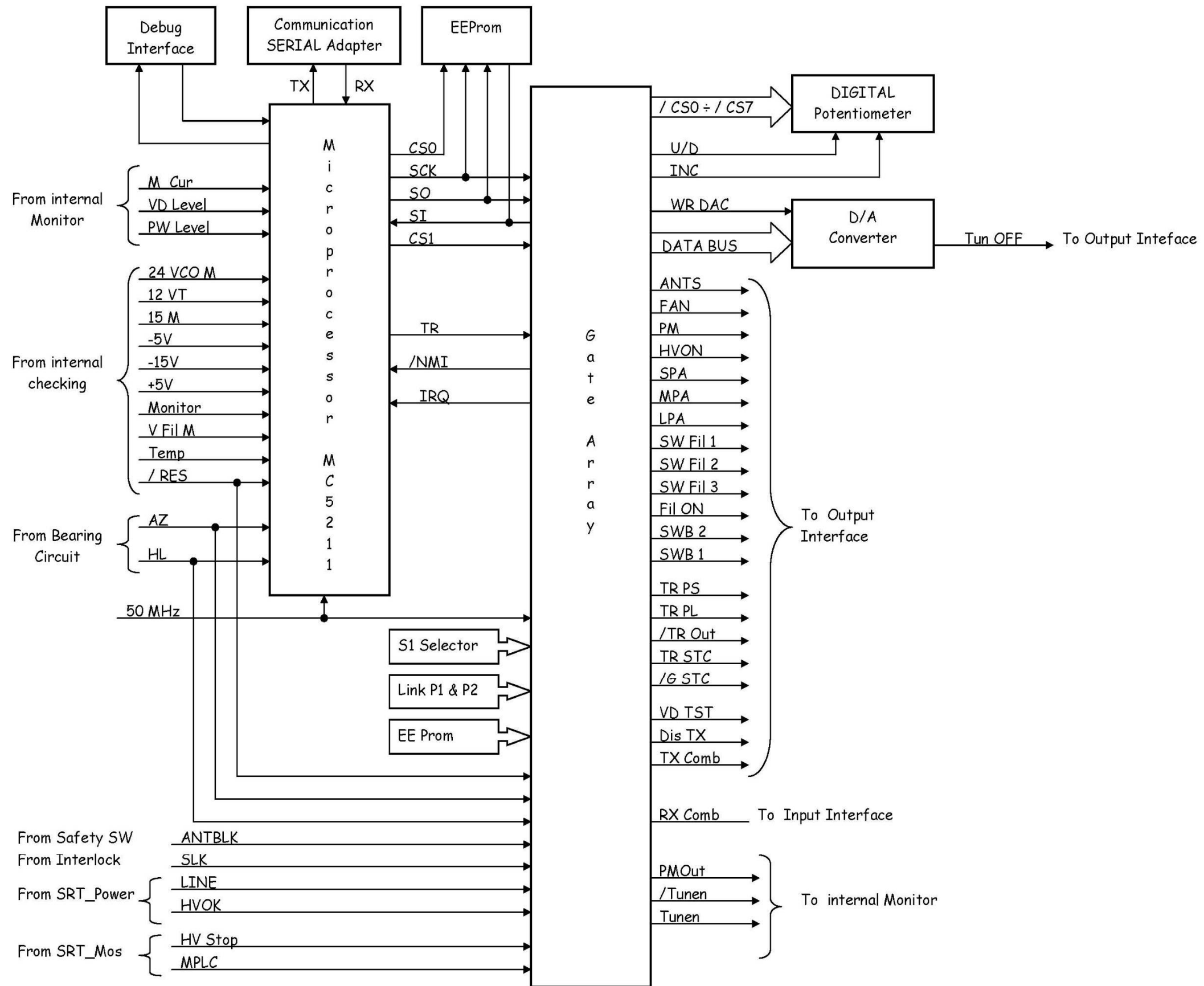
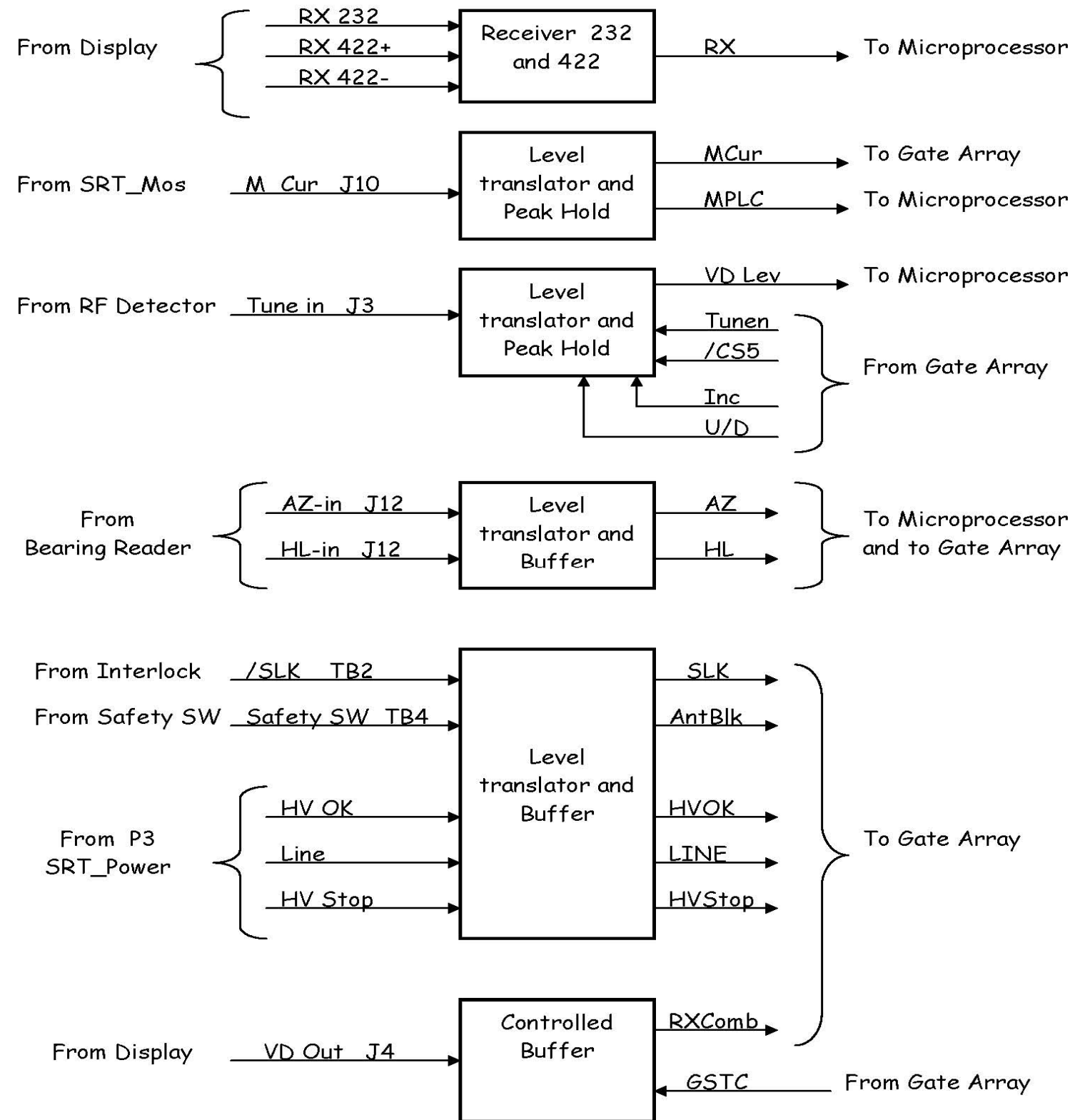


Figure 9.1.20 SRT\_CONTROL – Input interface



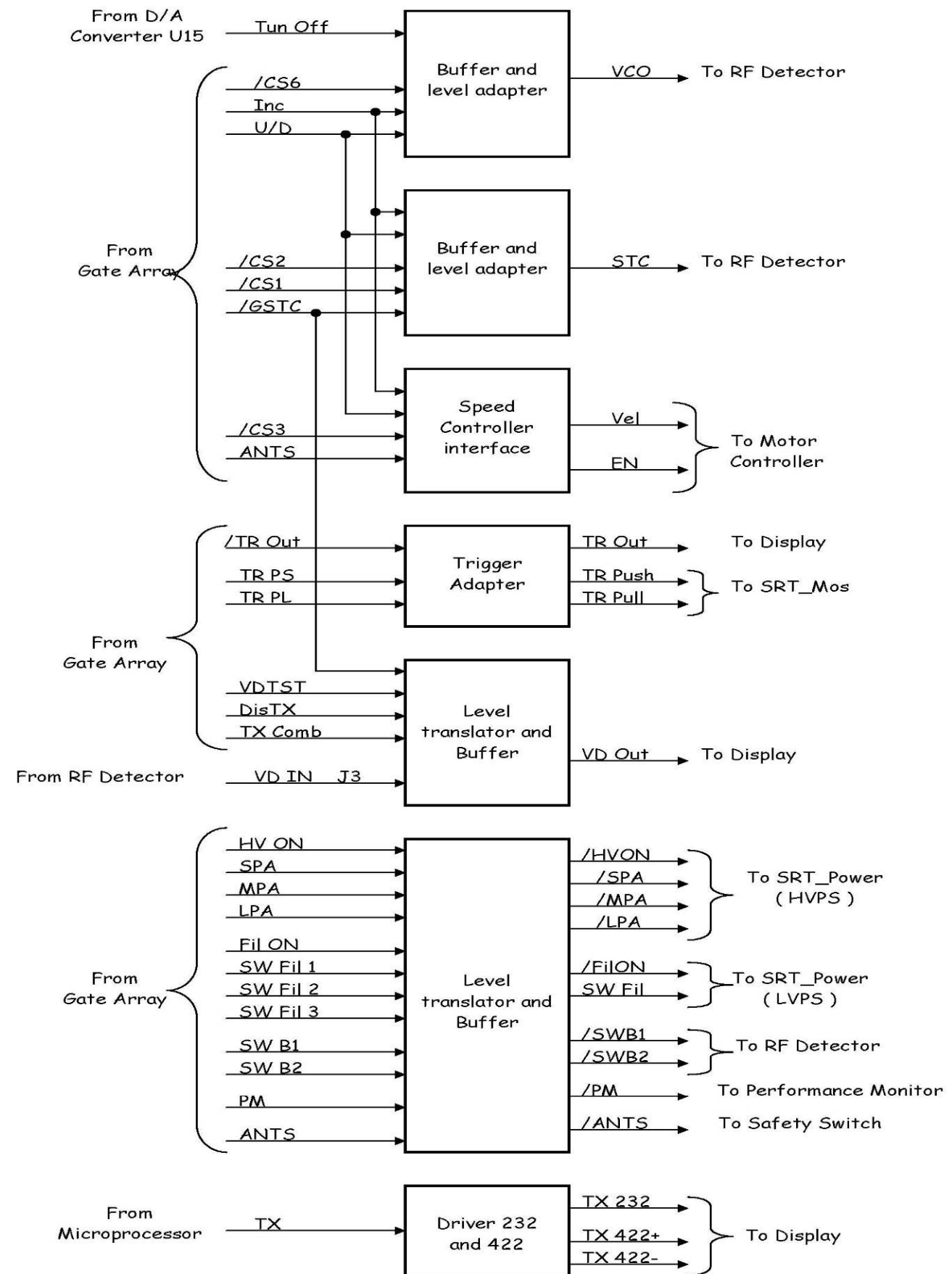


Figure 9.1.21 SRT\_CONTROL – Output interface

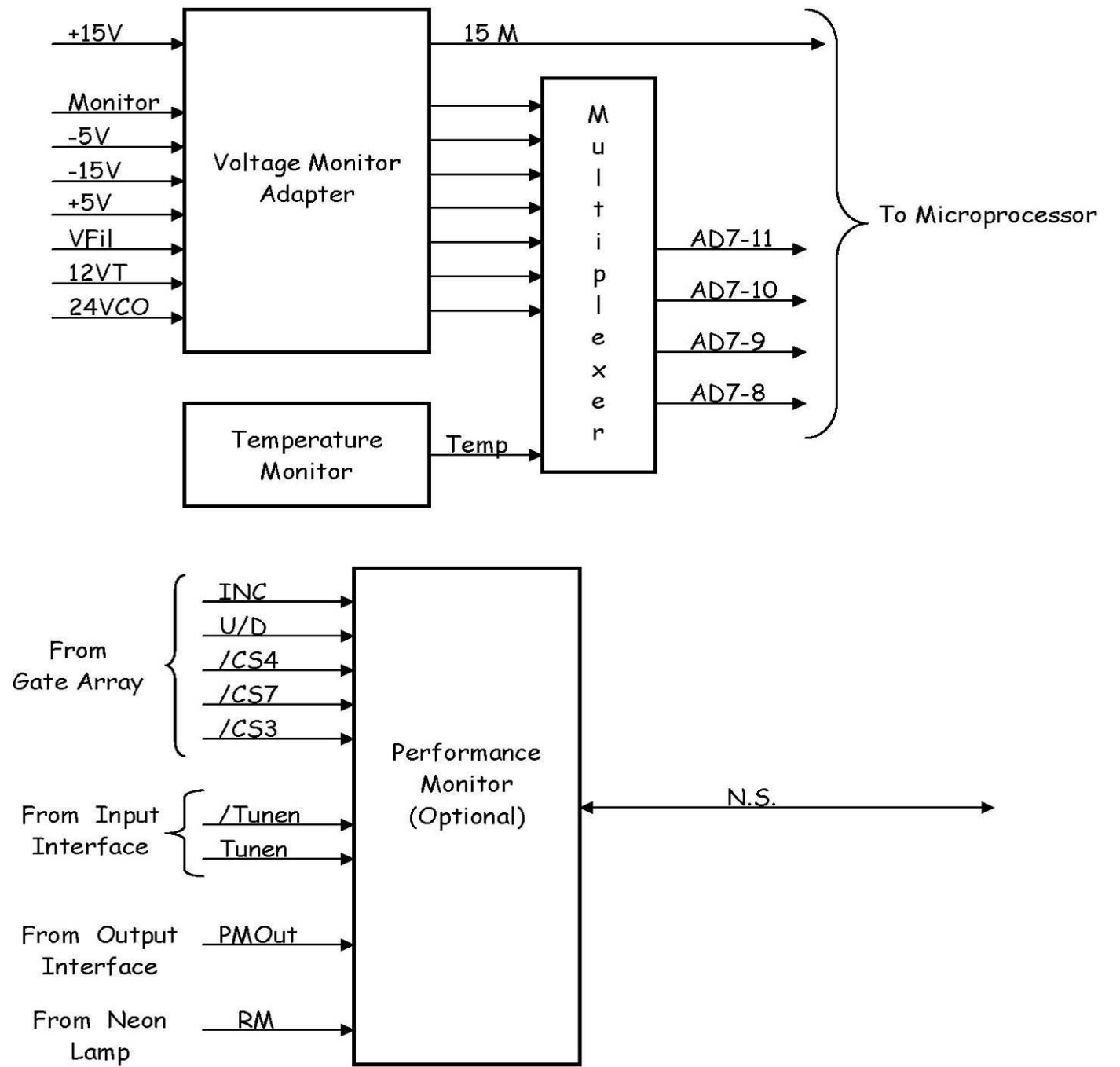


Figure 9.1.22 SRT\_CONTROL - Monitor

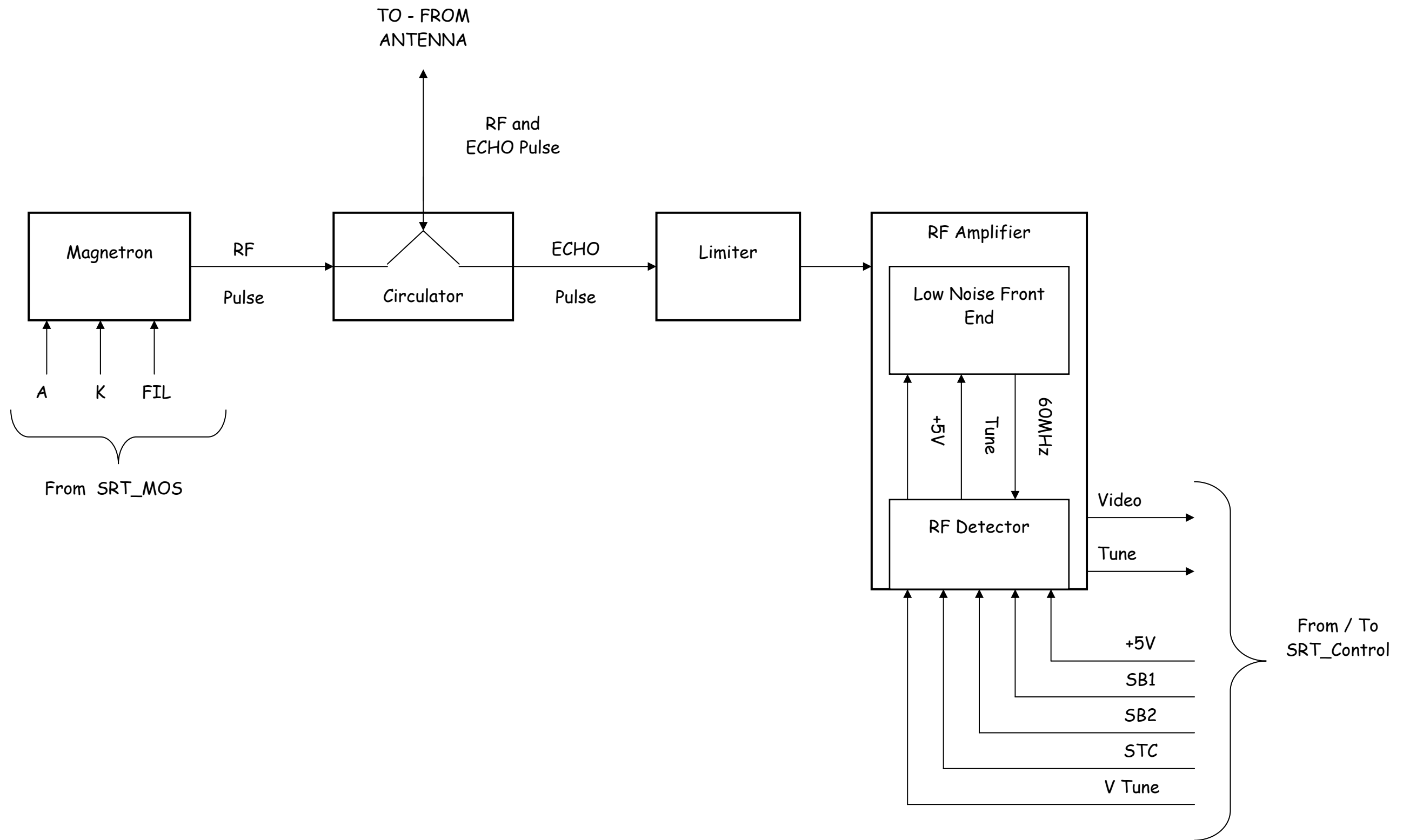


Figure 9.1.23 SRT RF HEAD – Functional block diagram



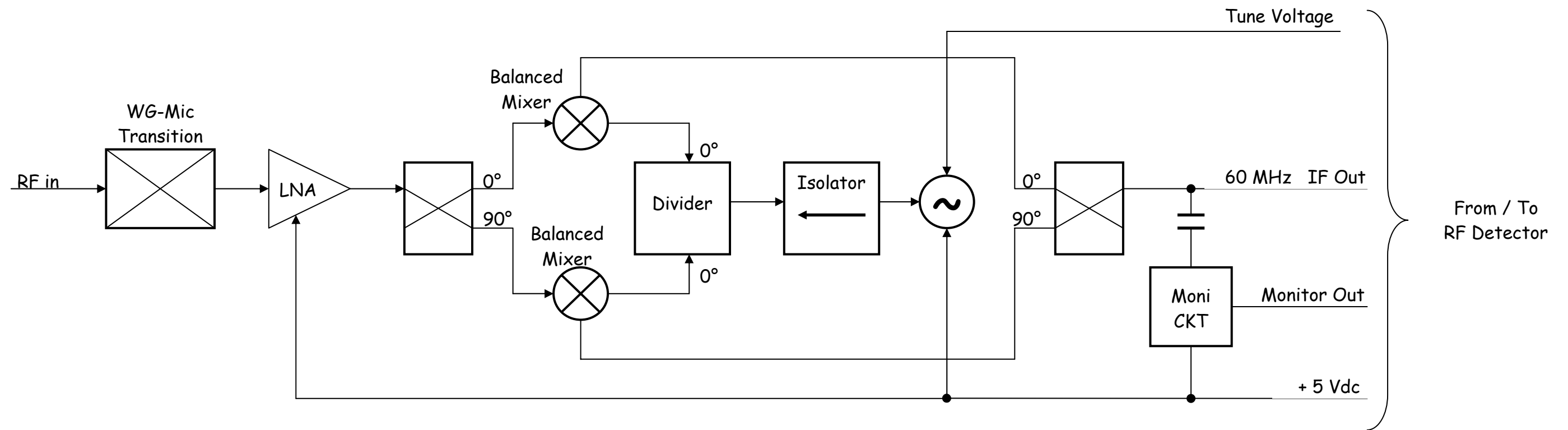


Figure 9.1.24 SRT RF HEAD - L.N.F.E.

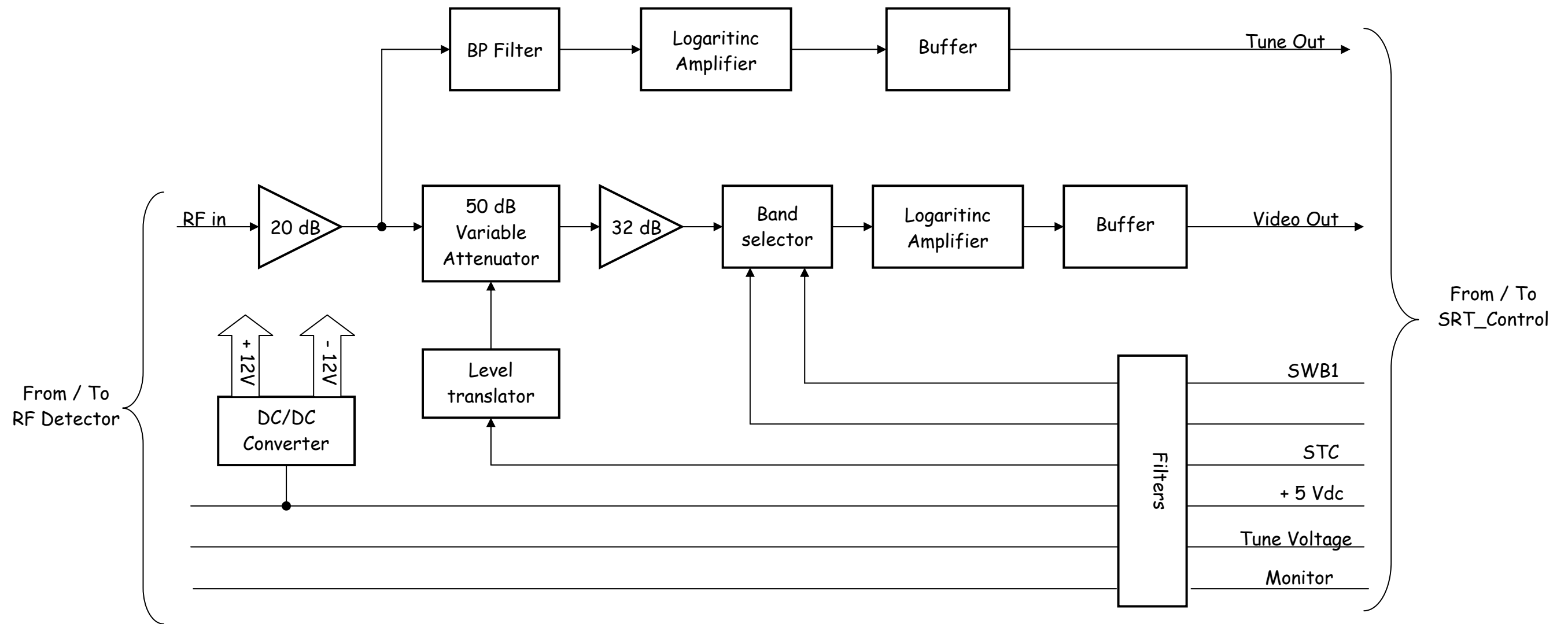


Figure 9.1.25 SRT RF HEAD - RF Detector

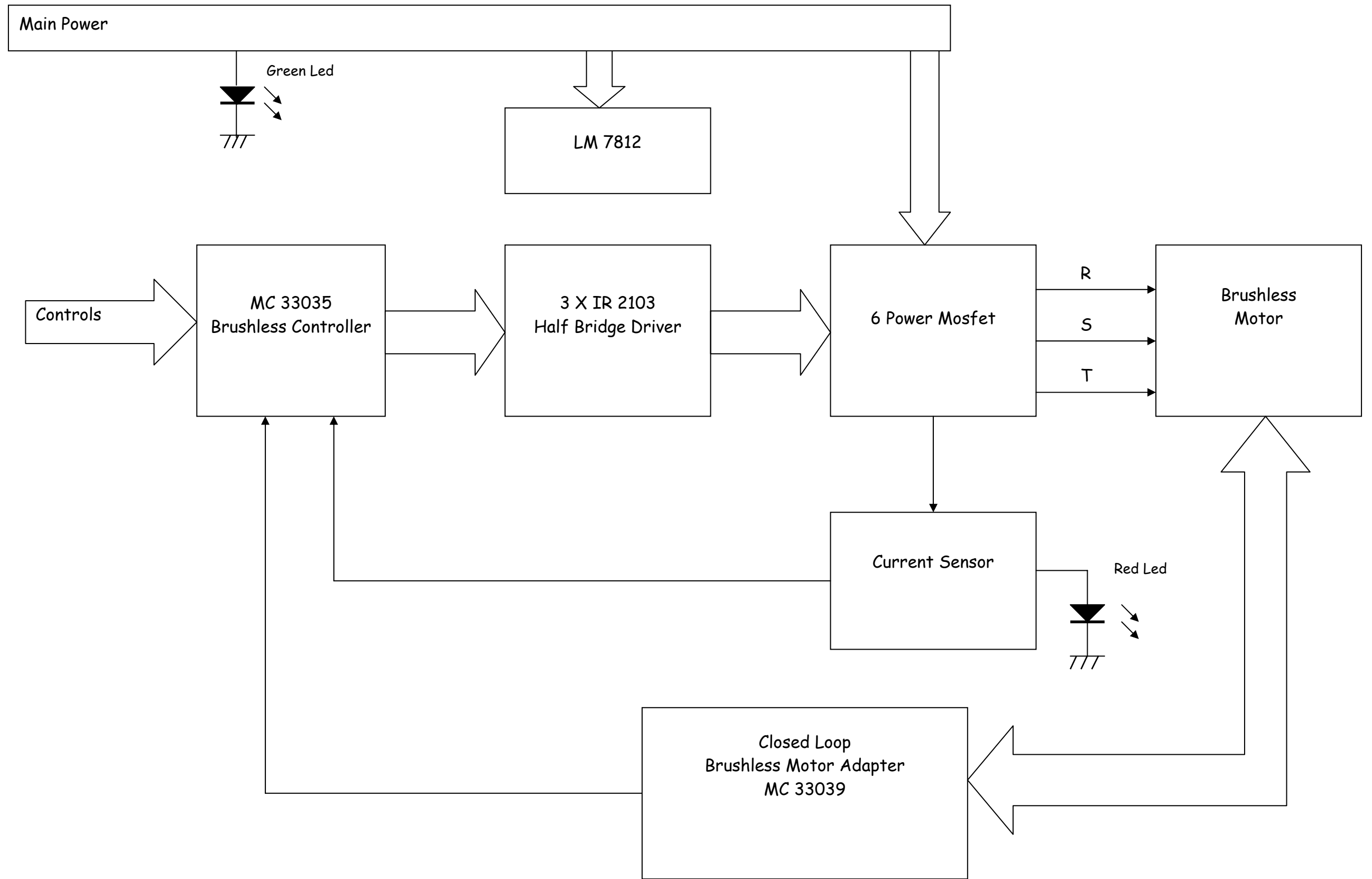


Figure 9.1.26 BRUSHLESS CONTROLLER – Functional blocks

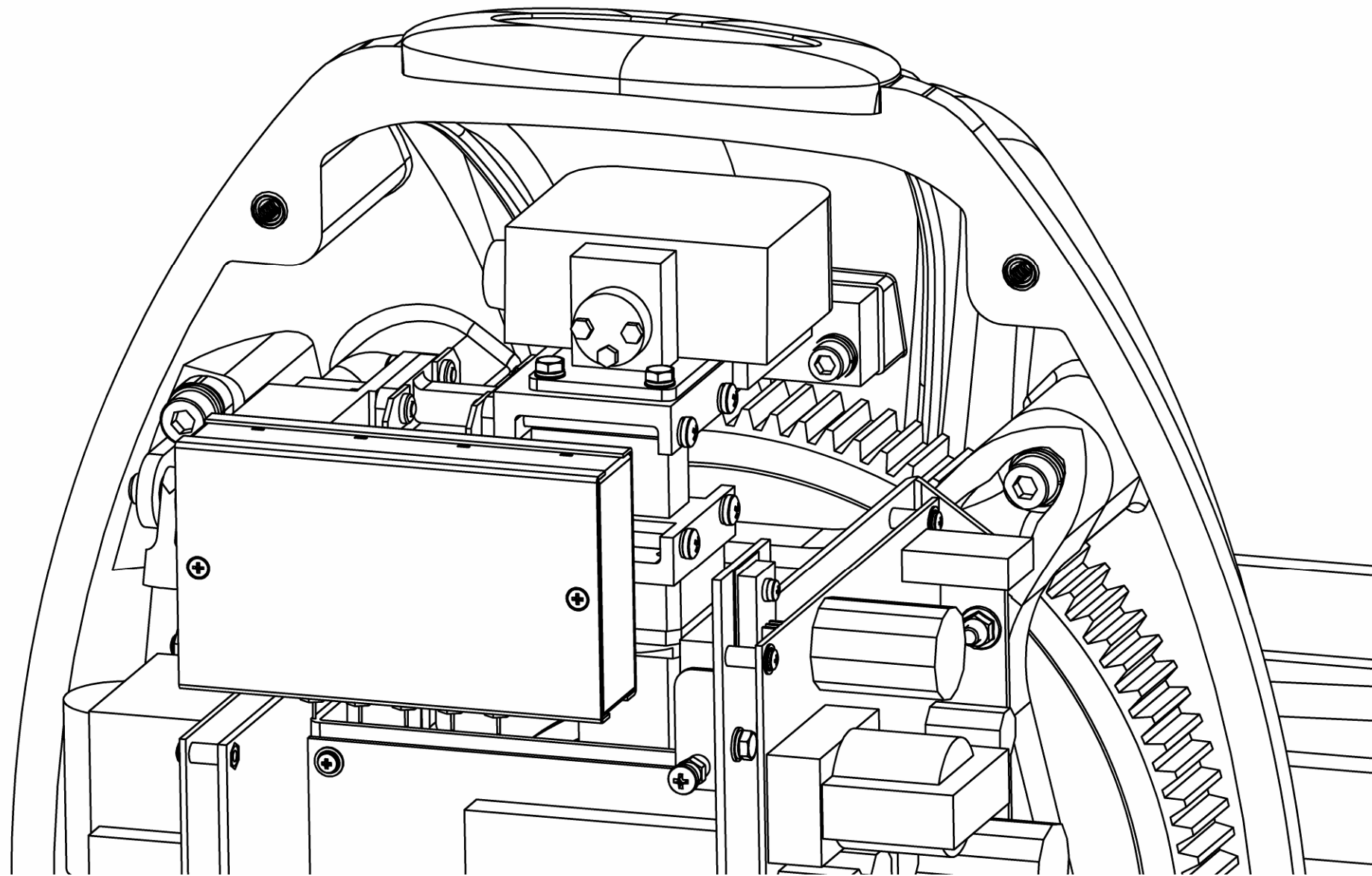


Figure 9.1.27 Electronics Rack – Particular of the RF Head

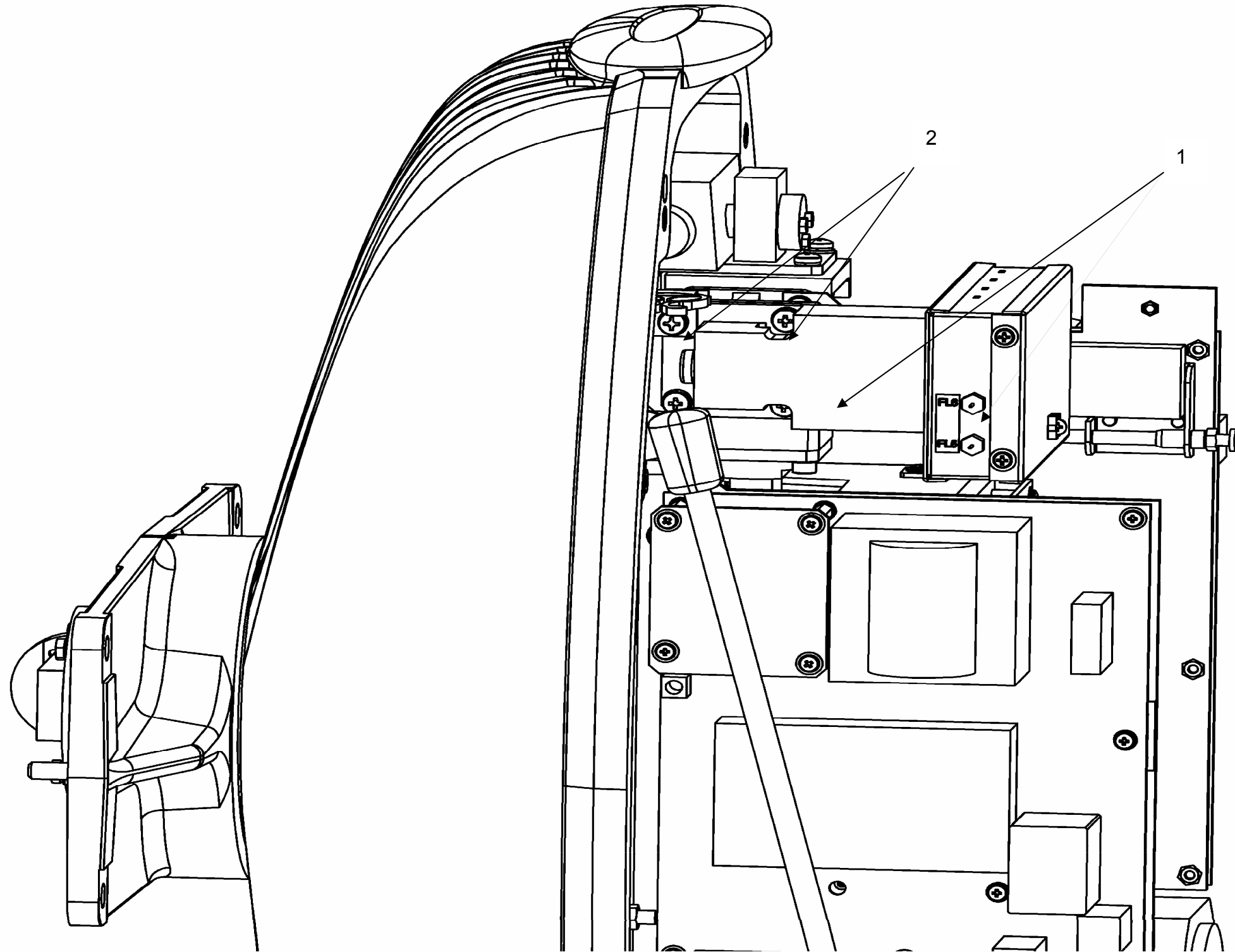


Figure 9.1.28 RF Amplifier

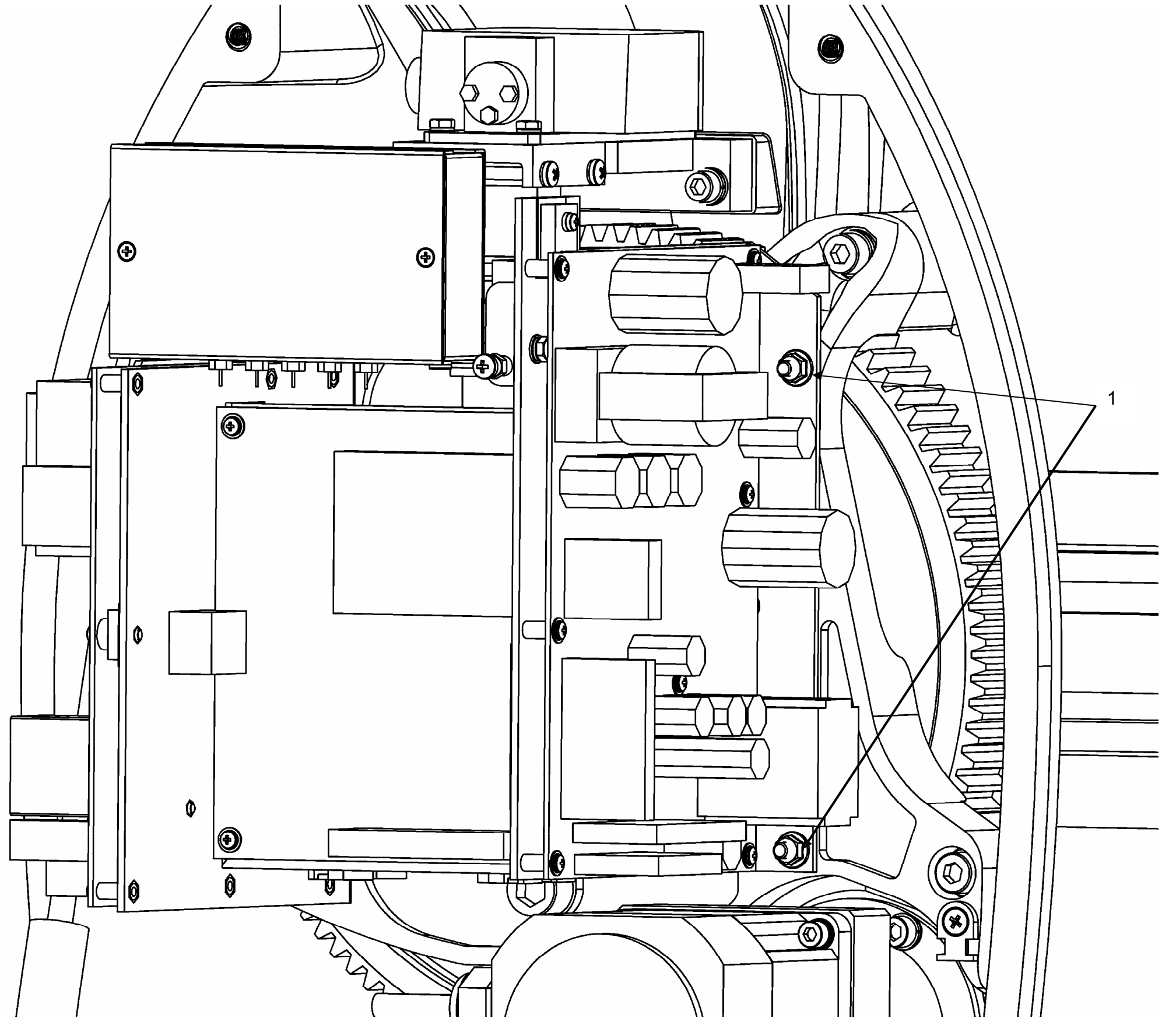


Figure 9.1.29 Electronics rack

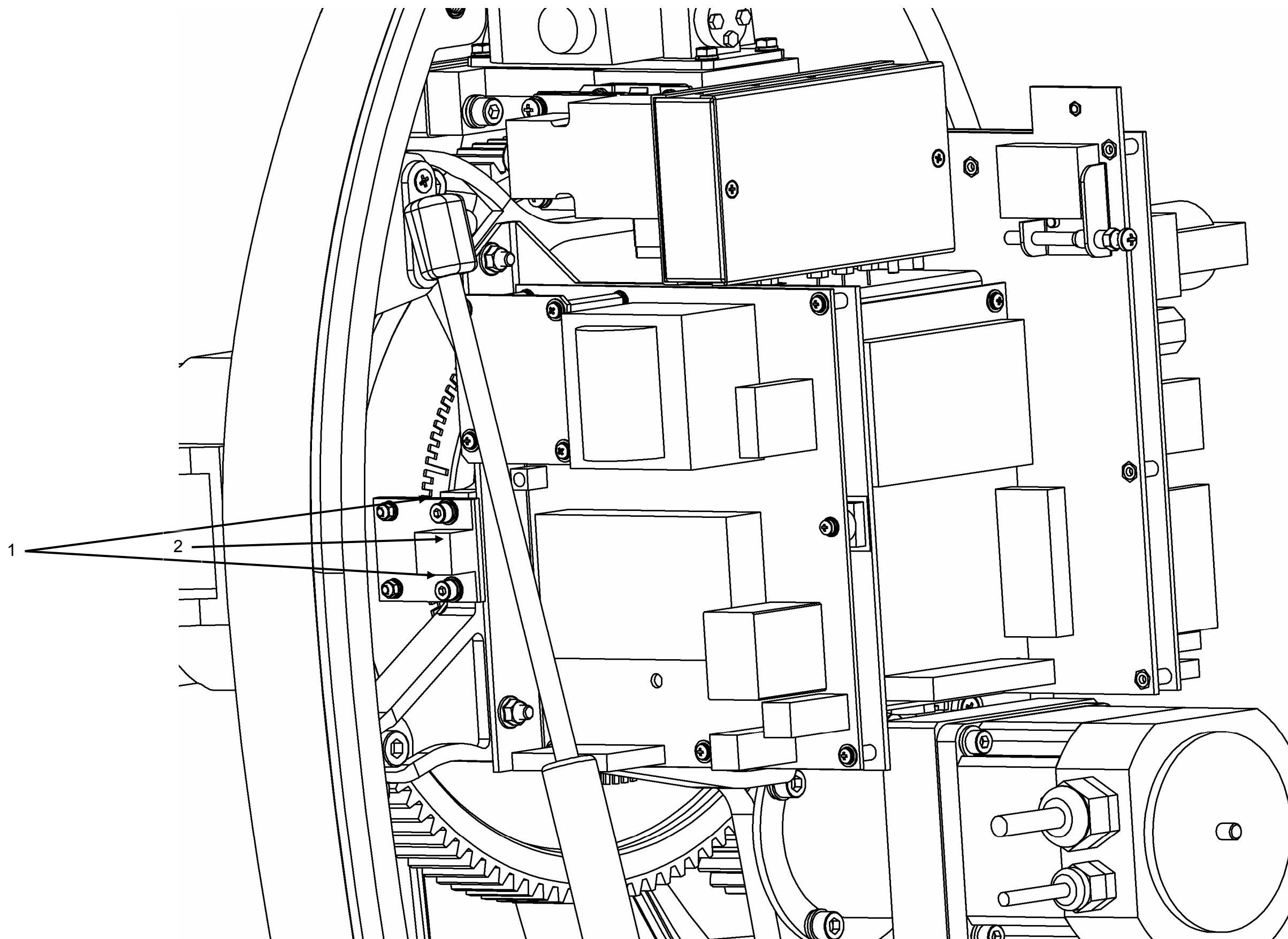


Figure 9.1.30 Bearing reader board

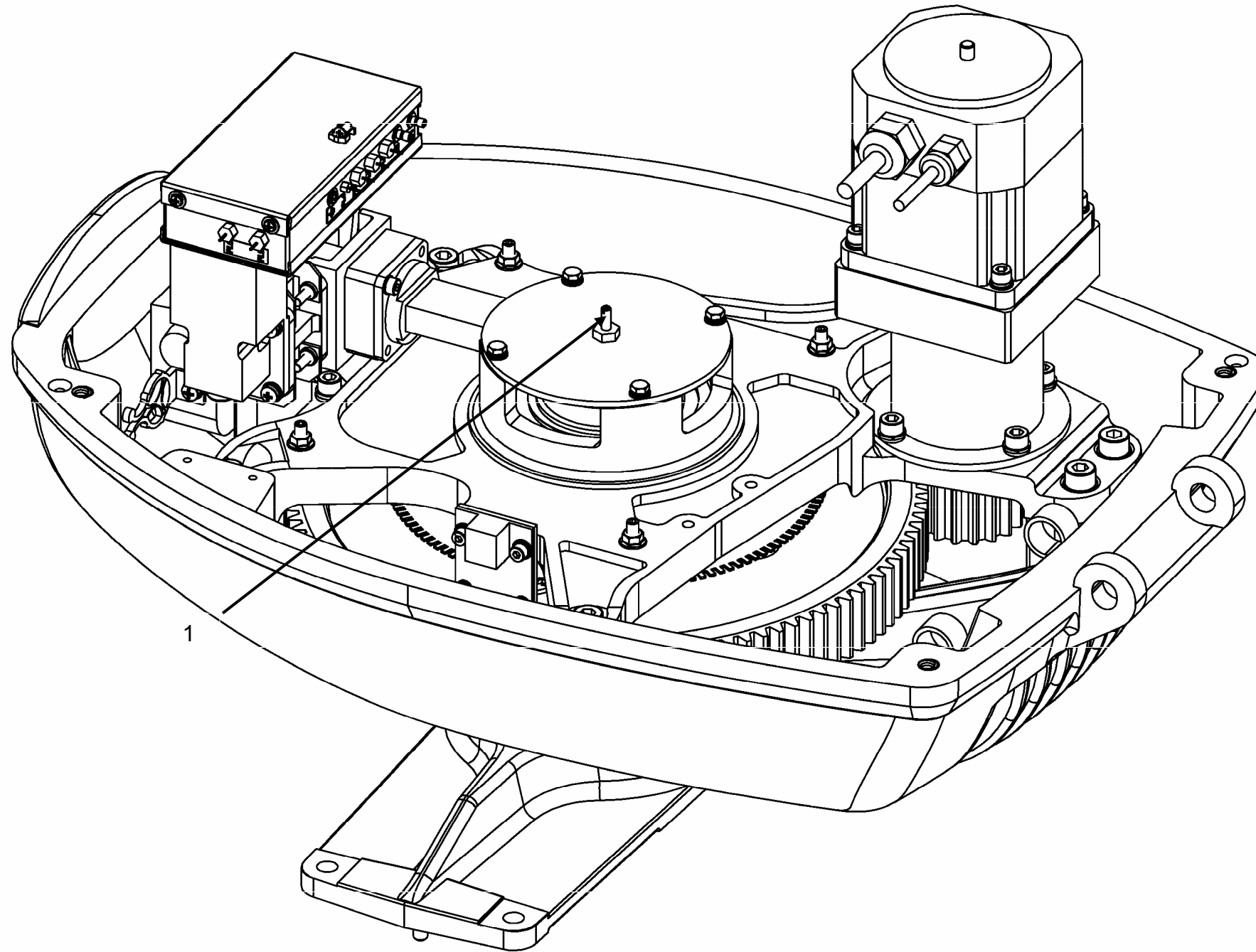


Figure 9.1.31 Rotary joint



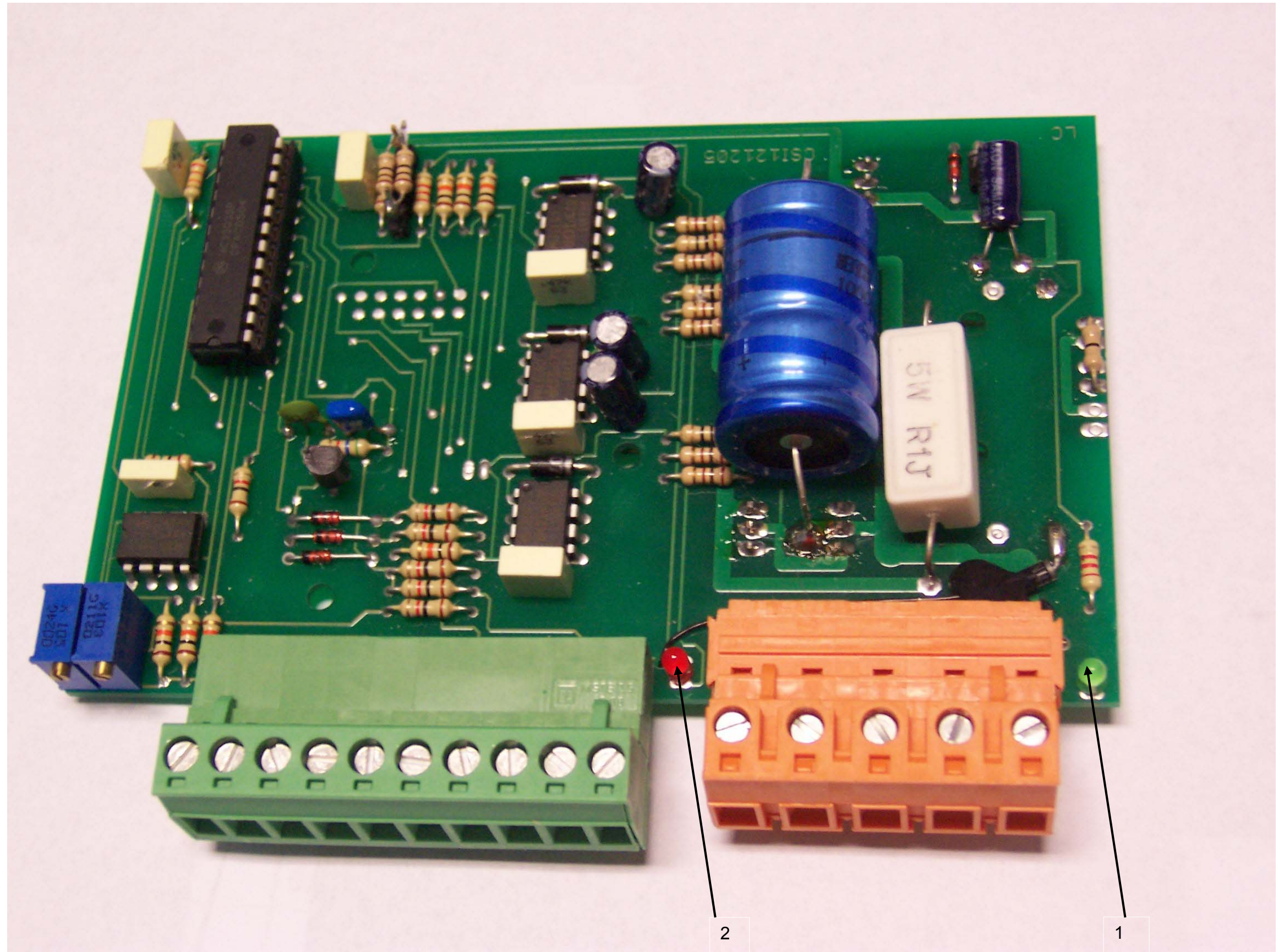
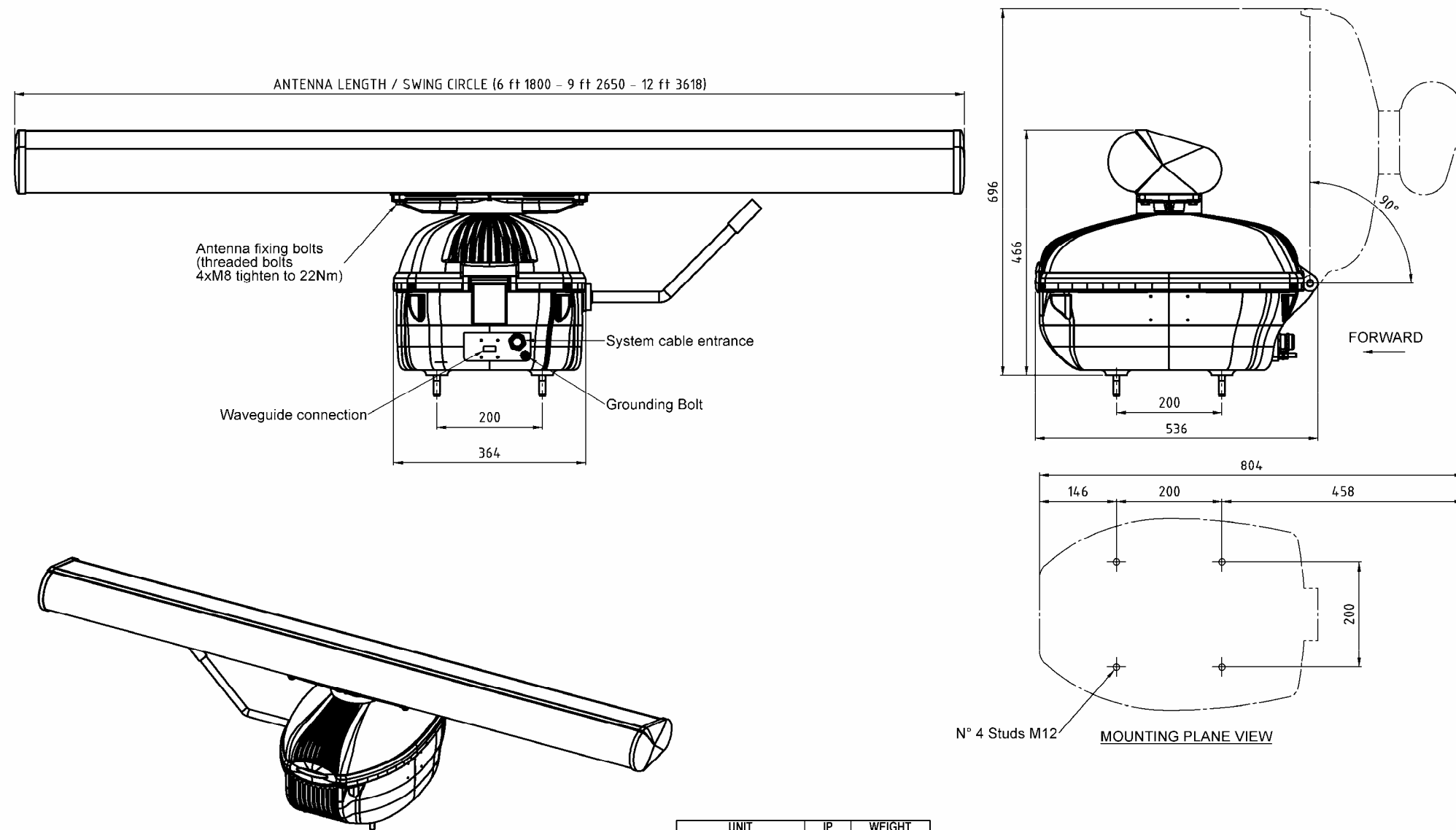


Figure 9.1.32 Brushless Motor Controller

Figure 9.1.33

SRT Downmast Pedestal  
dimensions drawing



| UNIT                | IP | WEIGHT |
|---------------------|----|--------|
| SRT & Antenna 6 Ft  | 65 | 38Kg   |
| SRT & Antenna 9 Ft  | 65 | 42Kg   |
| SRT & Antenna 12 Ft | 65 | 47Kg   |

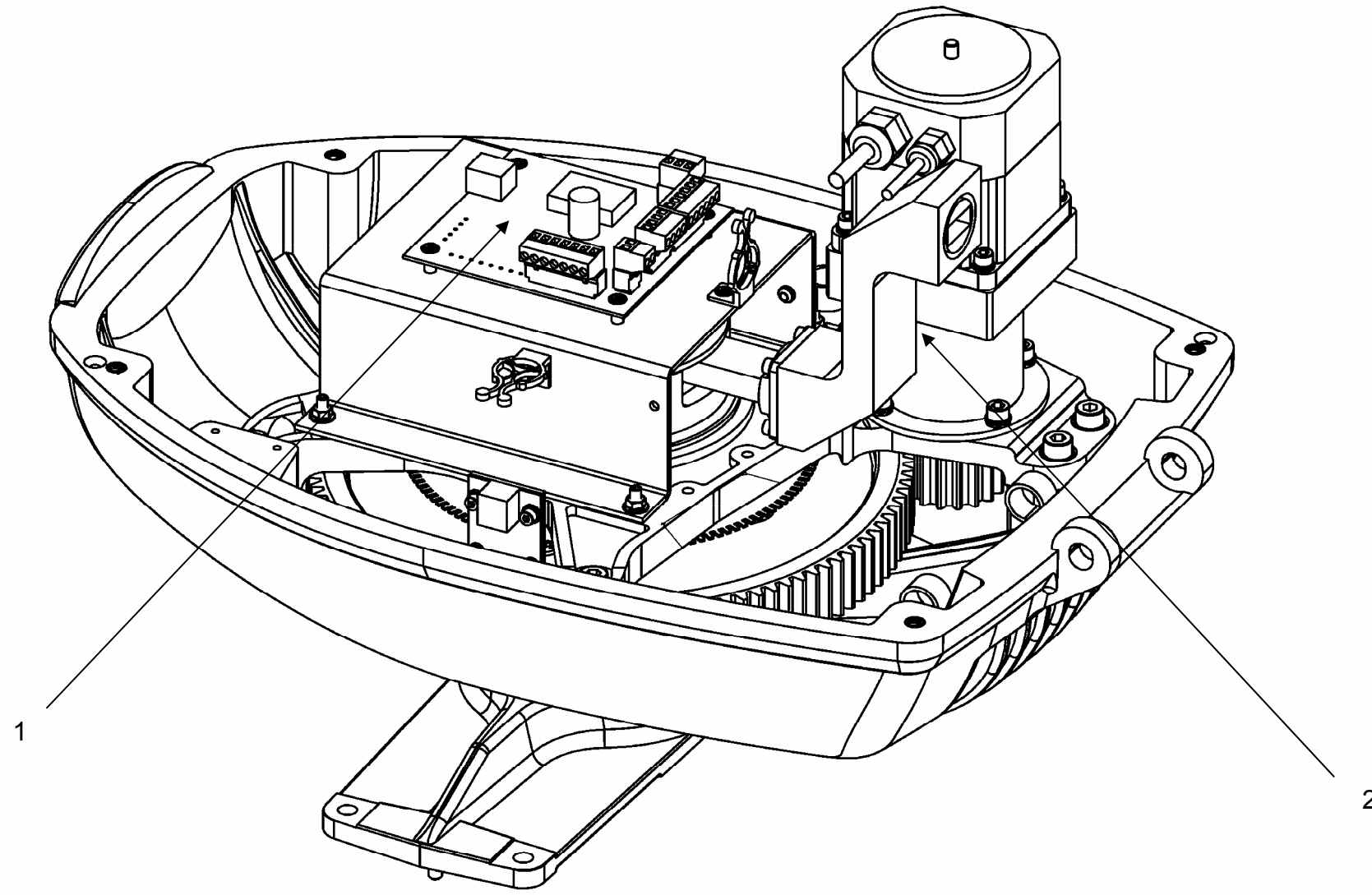


Figure 9.1.34 SRT Downmast Configuration Mechanical Assembly

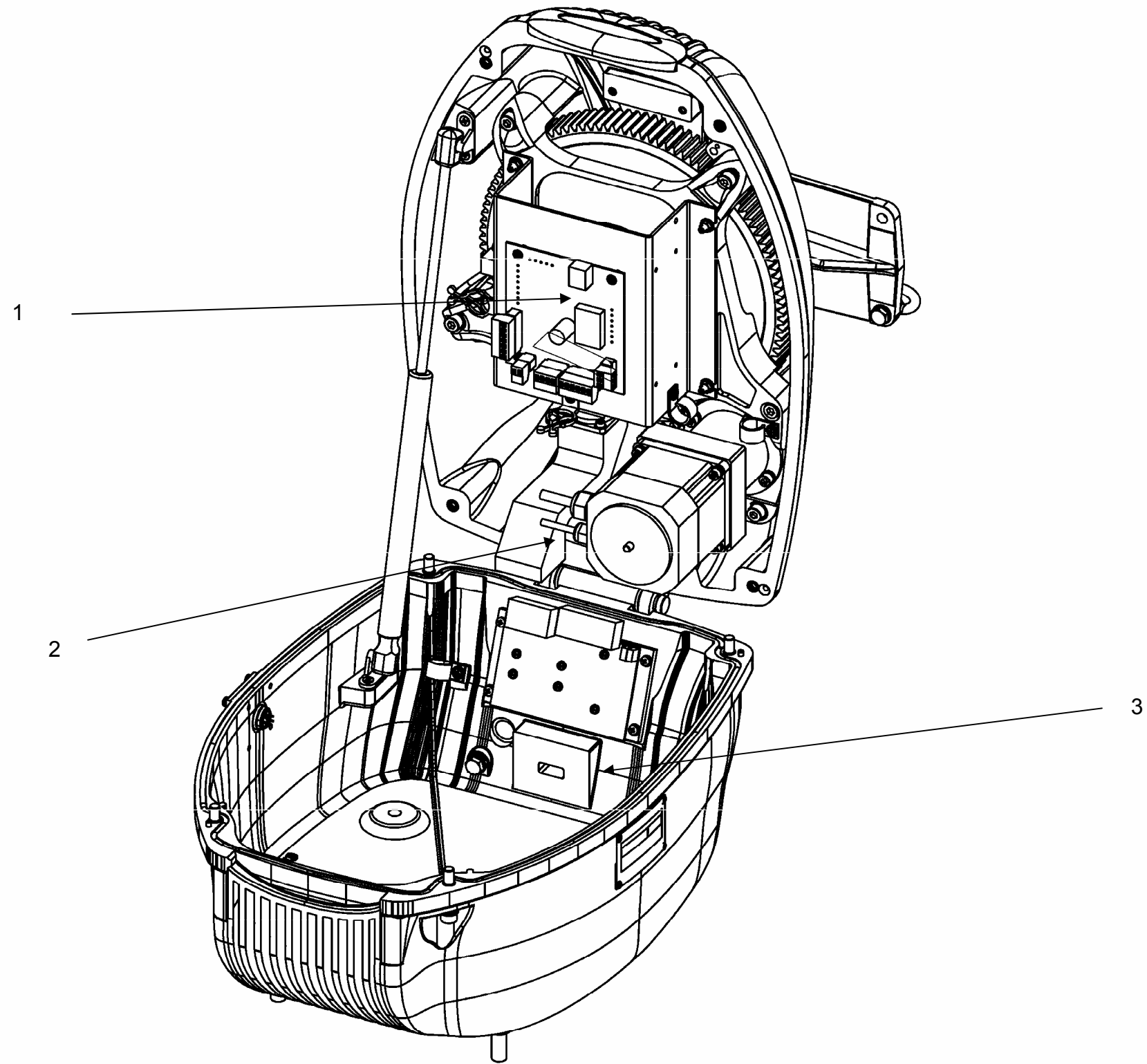


Figure 9.1.35 SRT Downmast Configuration Mechanical Assembly

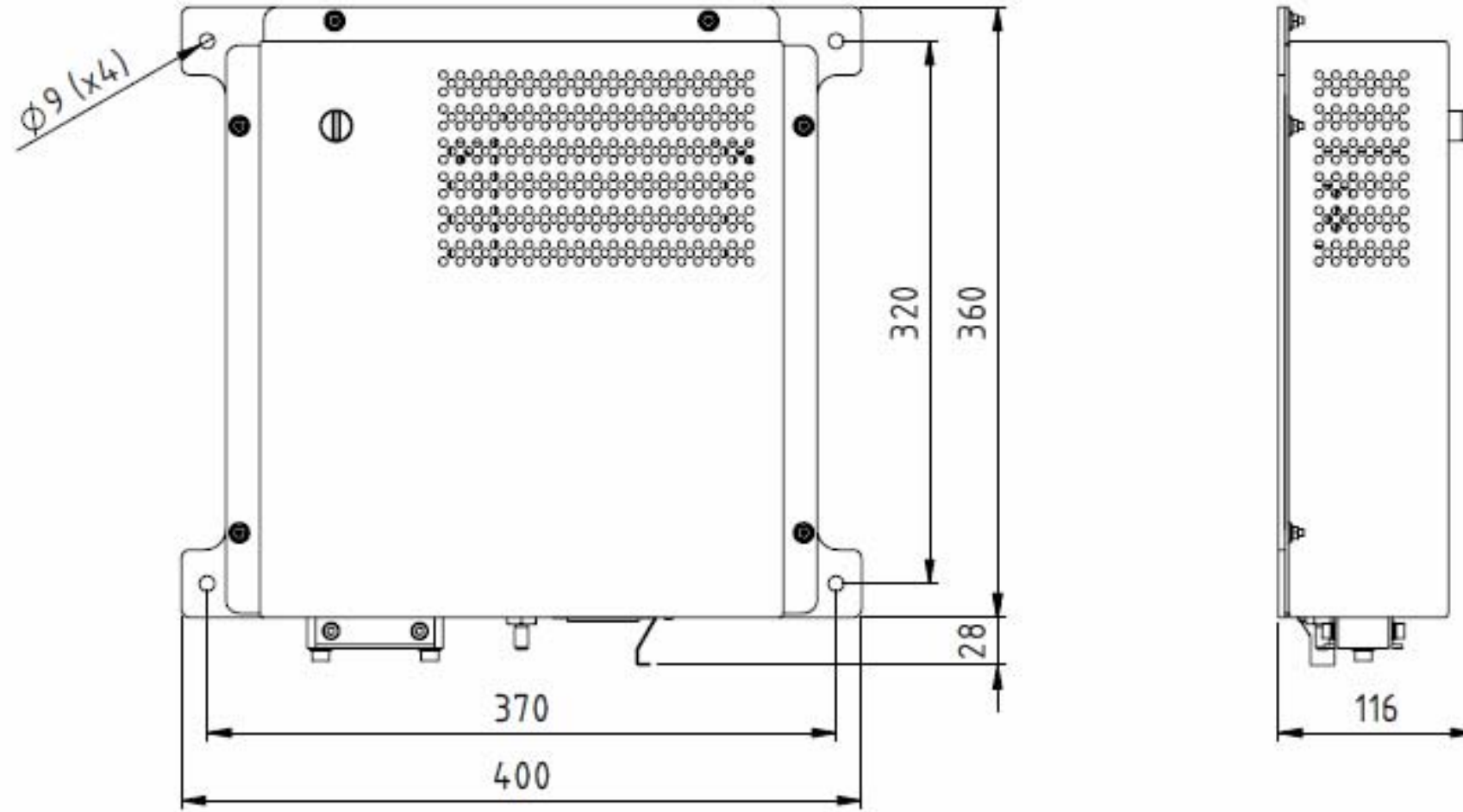


Figure 9.1.36 SRT Adapter Box