

# Preliminary

*future*  
The Future of Mobile Radio

## MASTR® III RF Package, VHF

### TABLE OF CONTENTS

|                                |                    |
|--------------------------------|--------------------|
| TRANSMIT SYNTHESIZER . . . . . | LBI-38640          |
| RECEIVE SYNTHESIZER . . . . .  | LBI-38641          |
| RECEIVE RF MODULE . . . . .    | LBI-38642          |
| IF MODULE . . . . .            | LBI-38643          |
|                                | LBI-39123          |
| POWER AMPLIFIER . . . . .      | LBI-38531          |
|                                | AE/LZB 119 3521/20 |
| DUPLEXER . . . . .             | LBI-38763          |

**TABLE OF CONTENTS**

|                                   | <u>Page</u> |
|-----------------------------------|-------------|
| SPECIFICATIONS . . . . .          | 1           |
| REGULATORY APPROVALS . . . . .    | 2           |
| MODULE NUMBERS . . . . .          | 2           |
| ISOLATOR . . . . .                | 3           |
| ANTENNA SWITCH . . . . .          | 3           |
| INTERCONNECTION DIAGRAM . . . . . | 4           |

**SAFETY NOTES**

- The means of disconnecting power from a station cabinet is the cabinet power supply plug.
- When conducting repair/maintenance, disconnect the cabinet power supply plug from the AC source.
- In European applications, equipment must be installed in a closed cabinet.
- Only replace components with components specified by M/A-COM Private Radio Systems.

**NOTICE!**

Repairs to this equipment should be made only by an authorized service technician or facility designated by the supplier. Any repairs, alterations or substitution of recommended parts made by the user to this equipment not approved by the manufacturer could void the user's authority to operate the equipment in addition to the manufacturer's warranty.

**NOTICE!**

The software contained in this device is copyrighted by the M/A-COM Private Radio Systems, Inc. Unpublished rights are reserved under the copyright laws of the United States.

This manual is published by **M/A-COM Private Radio Systems, Inc.**, without any warranty. Improvements and changes to this manual necessitated by typographical errors, inaccuracies of current information, or improvements to programs and/or equipment, may be made by **M/A-COM Private Radio Systems, Inc.**, at any time and without notice. Such changes will be incorporated into new editions of this manual. No part of this manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, for any purpose, without the express written permission of **M/A-COM Private Radio Systems, Inc.**

**SPECIFICATIONS**

**Table 1 - Station Specifications**

| ITEM   | SPECIFICATION  |
|--|--|
| <b>RECEIVER</b>  |  |
| SENSITIVITY (12 dB SINAD)  | -116 dBm (0.35 μV)   |
| SELECTIVITY (25 kHz)<br>(30 kHz)                                       | -95 dB<br>-100 dB  |
| INTERMODULATION REJECTION  | -90 dB   |
| INTERMEDIATE FREQUENCY   | 21.4 MHz (low-side injection)  |
| IMAGE REJECTION  | -100 dB  |
| SPURIOUS RESPONSE REJECTION  | -100 dB  |
| HUM & NOISE (300-3000 Hz)  | -55 dB   |
| AUDIO RESPONSE (de-emphasis)   | +1/-3 dB of 6 dB/Octave (@ Line Output)<br>+2/-8 dB of 6 dB/Octave (@ Local Speaker) |
| FREQUENCY SPREAD (range)<br>(full specification)<br>(3 dB degradation) | 136.0-151 MHz, 150.8-174 MHz<br>2 MHz<br>3 MHz                                       |
| <b>TRANSMITTER</b>   |  |
| RATED POWER OUTPUT   | 110 Watts  |
| FREQUENCY STABILITY  | ±1.5 ppm   |
| CONDUCTED SPURIOUS EMISSIONS   | -36 dBm  |
| MODULATION DEVIATION   | ±5 kHz   |
| FM HUM & NOISE (300-3000 Hz)   | -55 dB   |
| AUDIO RESPONSE (pre-emphasis)  | +1/-3 dB of 6 dB/Octave  |
| FREQUENCY SPREAD (range)<br>(full specification)                       | 136.0-151 MHz, 150.8-174 MHz<br>136.0-151 MHz, 150.8-174 MHz                         |

**REGULATORY APPROVALS**

The following equipment authorization numbers have been granted:

| <u>COUNTRY</u> | <u>REGULATORY APPROVAL</u>                  |
|----------------|---|
| United States  | FCC (Parts 15, 22, 74, 80, 90) AXATR-197-A2 |
| Canada         | DOC (RSS-119) TR-197                        |

**MODULE NUMBERS**

|   |              |
|---|--------------|
| TRANSMIT SYNTHESIZER . . . . .                | 19D902780G1  |
| RECEIVE SYNTHESIZER (150.8-174 MHz) . . . . . | 19D902781G1  |
| (136.0-151 MHz) . . . . .                     | 19D902781G2  |
| RX FRONT END MODULE (150.8-174 MHz) . . . . . | 19D902782G2  |
| (136.0-151 MHz) . . . . .                     | 19D902782G1  |
| IF MODULE . . . . .                           | 19D902783G1  |
| POWER AMPLIFIER . . . . .                     | 19D902797G1  |
| . . . . .                                     | 19D902797G20 |
| . . . . .                                     | 19D902797G21 |
| LOW PASS FILTER . . . . .                     | 19D902856G1  |
| ANTENNA SWITCH . . . . .                      | 19B235897P1  |
| ISOLATOR . . . . .                            | 344A3406P2   |
| DUPLEXER (150-162 MHz) . . . . .              | 344A3371P1   |
| DUPLEXER (162-174 MHz) . . . . .              | 344A3371P2   |

Specifications

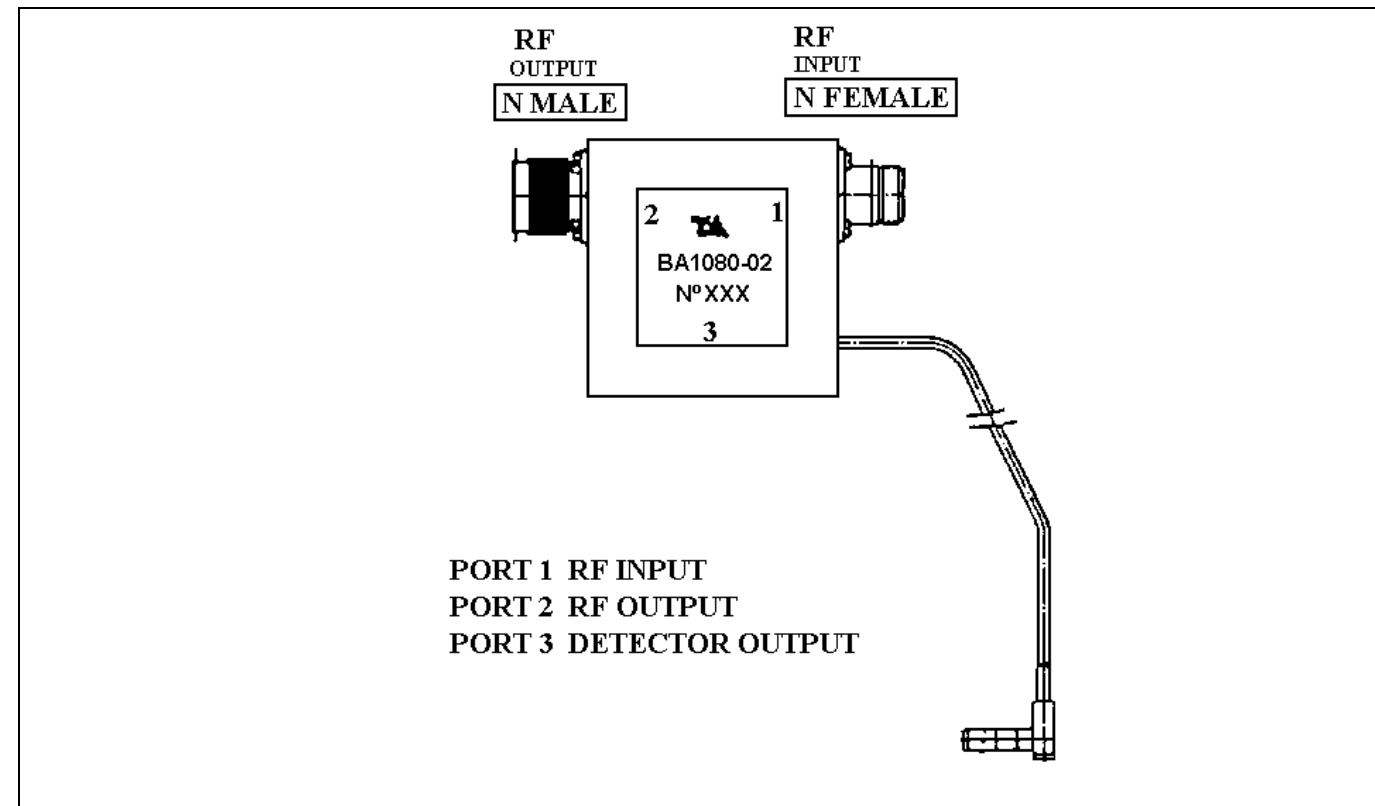
|                        |   |
|------------------------|---|
| Frequency Range        | 136-174 MHz (no tuning)<br>150 W (at max VSWR of 3.7:1) |
| Input Power            | 150 W (at max VSWR of 3.7:1)                            |
| Short Circuit Duration | 100 ms max  |
| Insertion Loss         | 0.3 dB max (25°C)<br>0.8 dB max (-40°C to +85°C)        |
| Isolation              | 18 dB min (25°C)<br>15 dB min (-40°C to +85°C)          |

Description

The isolator has an internal load connected to an RF detector (sensor), the output from the sensor is continually monitored by the station for a fault condition (high VSWR). Once the station detects a sensor voltage above the threshold the transmitter is automatically de-keyed and a FAULT condition is reported.

**IMPORTANT:** The sensor output must be connected to P108 on the Interface Board when the Isolator is used, failure to make this connection with the Isolator installed will cause the isolator to be damaged under high VSWR conditions.

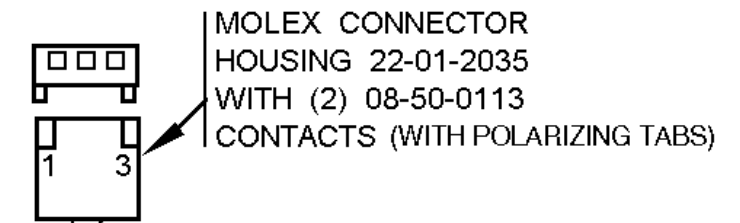
| REFLECTED POWER | VSWR   | TYPICAL SENSOR VOLTAGE |
|-----------------|--------|------------------------|
| 10W             | 1.70:1 | 3.9V                   |
| 15W             | 1.92:1 | 4.8V                   |
| 20W             | 2.15:1 | 5.7V                   |
| 25W             | 2.38:1 | 6.4V                   |
| 30W             | 2.62:1 | 6.8V                   |



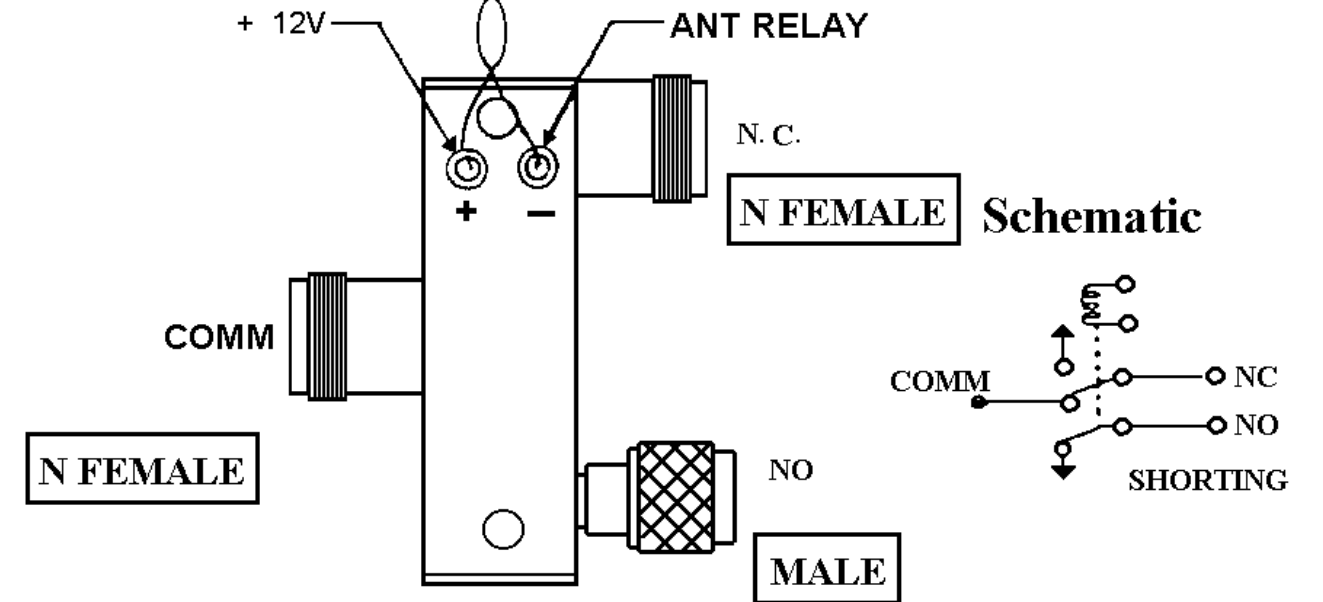
**WARNING**

DO NOT USE ISOLATOR WITHOUT CONNECTING THE SENSOR TO THE STATION

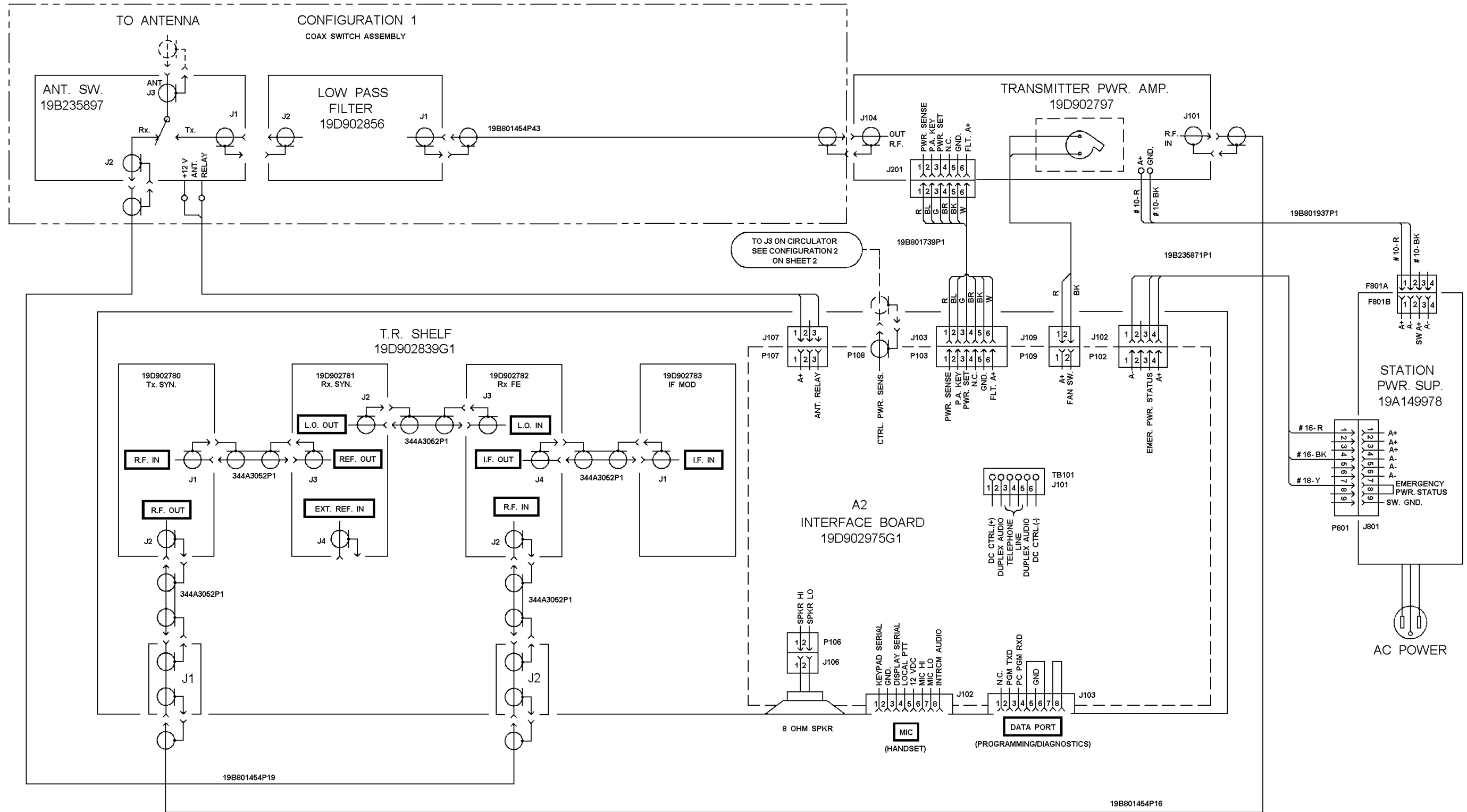
**ISOLATOR**  
344A3406P1



2 #24 AWG WIRES TWISTED TOGETHER  
1 ORANGE (+) TO PIN 1  
1 BLACK (-) TO PIN 3



**ANTENNA SWITCH**  
19B235897P2



MASTR III STATION

(19D903635 Sh. 1, Rev. 4)

