

P9CFMT-25

Technical Data for FCC Certification

Active Devices and Function List

Translator Main PCB #654-Z0027

| DEVICE     | TYPE       | FUNCTION                    |
|------------|------------|-----------------------------|
| BB405B     | Diode      | Variable Capacitance        |
| BAT83/85   | Diode      | Schottky Rectifier          |
| 1N4004     | Diode      | Rectifier                   |
| PMLL4148   | Diode      | Small Signal Switching      |
| BB809      | Diode      | Variable Capacitance        |
| BYV27-200  | Diode      | 200V Fast Recovery          |
| BYV10-60   | Diode      | Small Signal Schottky       |
| BB804      | Diode      | Variable Capacitance        |
| BBY40      | Diode      | Variable Capacitance        |
| TUF-1      | Diode      | Mixer                       |
| BF245A     | Transistor | Small Signal JFET           |
| BC550A     | Transistor | Small Signal                |
| PN2222A    | Transistor | Small Signal                |
| PN2907A    | Transistor | Small Signal                |
| J309       | Transistor | JFET                        |
| BFR93      | Transistor | Wideband                    |
| 74HC132N   | IC         | Quad 2 I/P Schmitt Trigger  |
| 74HC74N    | IC         | Dual Positive Edge Trigger  |
| LF353N     | IC         | Dual Op Amp                 |
| LM358N     | IC         | Dual Op Amp                 |
| LM2575-HVT | IC         | Step-down Voltage Regulator |
| 7805       | IC         | +5V Regulator               |
| 79L12      | IC         | -12V Regulator              |
| LM317T     | IC         | +5V Adj Voltage Regulator   |
| TL064N     | IC         | Quad Op Amp                 |
| TL071CP    | IC         | Single Op Amp               |
| U893BSE    | IC         | Pre-scaler                  |
| TDA1591V3  | IC         | Stereo Decoder              |
| MSA0886    | IC         | RF Amplifier                |
| MC14151DW2 | IC         | PLL Synthesizer             |
| TDA1576    | IC         | FM Demodulator              |
| TL062N     | IC         | Dual Op Amp                 |
|            | Crystal    | 10MHz TCXO                  |

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Active Devices and Function List

Translator Display PCB #654-Z0028

| DEVICE     | TYPE       | FUNCTION                       |
|------------|------------|--------------------------------|
| 1N4148     | Diode      | Small Signal Switching         |
| PN2222A    | Transistor | Small Signal                   |
| PN2907A    | Transistor | Small Signal                   |
| 74HC4052CN | IC         | 4 Channel Analog Multiplier    |
| 4510BE     | IC         | BCD Counter                    |
| LM3914     | IC         | Linear Bargraph Display Driver |
| TL064N     | IC         | Quad Op Amp                    |
| 78L05      | IC         | +5V Regulator                  |
| 78L12      | IC         | +12V Regulator                 |

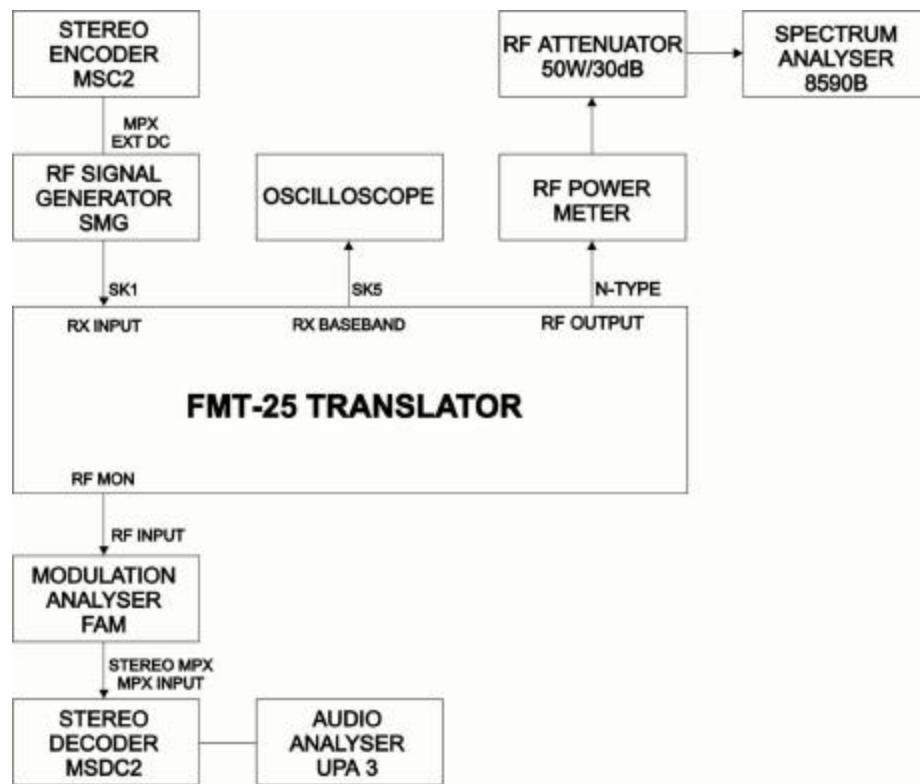
Translator Power Amplifier PCB #654-Z0029

| DEVICE    | TYPE       | FUNCTION                        |
|-----------|------------|---------------------------------|
| PMLL4148  | Diode      | Small Signal Switching          |
| BYV28-200 | Diode      | 200V Fast Recovery Rectifier    |
| MRF136Y   | Transistor | 30W MOSFET                      |
| MRF134    | Transistor | 5W MOSFET                       |
| LM2576T   | IC         | Adj Voltage Switching Regulator |
| MAV11     | IC         | RF Amplifier                    |

## Tune-up and Adjustment Procedure for FMT-25 Translator

### Test Equipment (Minimum Requirements)

|    | TYPE                   | MANUFACTURER |
|----|------------------------|--------------|
| 1. | RF Signal Generator    | R & S SMG    |
| 2. | Modulation Analyser    | R & S FAM    |
| 3. | Spectrum Analyser      | H.P. 8590B   |
| 4. | RF Power Meter         | Bird 43      |
| 5. | RF Attenuator 50W/30dB | Bird         |
| 6. | Stereo Encoder         | R & S MSC2   |
| 7. | Stereo Decoder         | R & S MSDC2  |
| 8. | Audio Analyser         | R & S UPA3   |
| 9. | Oscilloscope           | Tektronix    |



FMT-25 TEST SET-UP

### User Test and Alignment Procedure

The equipment supplied has been inspected and tested in accordance with the factory procedures. A test report has been supplied with the equipment and adjustments other than Tx and Rx frequency changes are not normally required.

The following adjustments can be made to optimize the performance of the equipment by using the prescribed list of test equipment (or similar alternatives).

#### Test procedure and adjustments

1. Connect equipment as shown in test set-up.
2. Rx frequency selection

The **Rx** frequency is set via “**SW2**” on the main PCB 378-Z0027. The frequency is set using a 12 bit binary code (see tables in manual). Select the required frequency.

3. Tx frequency selection

The **Tx** frequency is set via “**SW3**” on the main PCB 378-Z0027. The frequency is set using a 12 bit binary code (see tables in manual). Select the required frequency.

4. The highlighted references indicate the “user” adjustments that are allowed the others are factory set.

#### FMT-25 Switch-on Sequince

- a) Switch “ON” the FMT-25 and adjust the RF power to 25Watts via the “**PWR ADJ**” control on the front panel
  - b) Check the RF frequency displayed on the “modulation analyzer” is the same as the Tx selected frequency.
  - c) The **TCXO (IC7)** on the main PCB 378-Z0027 can be adjusted if necessary to achieve this.
  - d) Check spectrum analyzer for harmonics and spurious ( -60dBc)
5. Rx and Tx calibration (modulation).
    - a) Set the RF signal generator to the selected “Rx Frequency” with 1mV level. Set the deviation to 75kHz and the modulating frequency to 400Hz. Observe the Rx baseband output at **(SK5)** on the oscilloscope and ensure a level of 3.5p-p is shown. **R111** on main PCB 378-Z0027 can be adjusted to achieve this if necessary.
    - b) Check the peak deviation on the modulation analyzer is 75kHz. **R182** on the main PCB 378-Z0027 can be adjusted to achieve this.
    - c) Check the “MONO” distortion on the modulation analyzer is 0.25% **fine** adjustment of **C96** on the main PCB 378-Z0027 can be adjusted to achieve this if necessary.
    - d) Select “field” on the front panel multimeter and ensure a reading of 1mV. Adjust **R1** if necessary on the display PCB 378-Z0028 to achieve this.
    - e) Select “Baseband” on the front panel meter and ensure a reading of 1.2V. Adjust **R4** on the display PCB 378-Z0028 to achieve this.
    - f) Select “FORWARD” on the front panel multimeter and ensure a reading of 24W (with the RF output power adjusted to 24W). Adjust **R2** on the display PCB 378-Z0028 to achieve this.
    - g) The “Reflected” power adjustments are factory set and should not be adjusted by the user.

6. Rx and Tx calibration (stereo)

- a) Apply a "STEREO MPX" signal to the RF signal generator from the stereo encoder (via the ext DC input) and ensure 75kHz deviation with 10% pilot. Select "LEFT" channel only and observe the stereo signal on the stereo decoder (Left channel) and on the audio analyzer. Select the right channel on the stereo decoder and measure the channel separation L→R while checking the distortion on the left channel.

Check the performance at the following frequencies.

| Frequency | Separation | Distortion |
|-----------|------------|------------|
| 40Hz      | ≥50dB      | 0.25%      |
| 100Hz     | ≥50dB      | 0.25%      |
| 500Hz     | ≥50dB      | 0.25%      |
| 1kHz      | ≥50dB      | 0.25%      |
| 5kHz      | ≥50dB      | 0.25%      |
| 15kHz     | ≥50dB      | 0.25%      |

The following adjustments can be made.

Adjust **C109** on main PCB 378-Z0027 for best separation at 1kHz adjust **R92** on main PCB 378-Z0027 for best separation at 15kHz.

7.
  - a) Adjust the RF power to the required level (normally 24W – 26W). Ensure that no "Red Leds" are indicating fault conditions on the front panel. The unit is now ready for installation.