

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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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

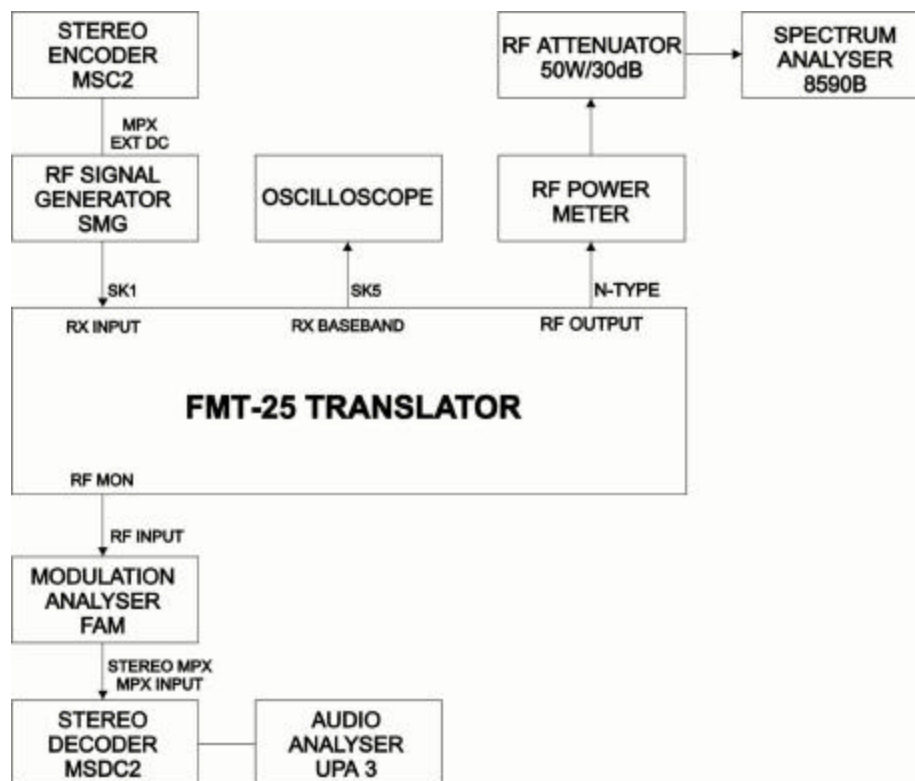
Translator Power Amplifier PCB #654-Z0029

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 MSC2
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 Sequence

- 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 (  $-60\text{dBc}$ )
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.