

S.E.M.

TRAN Z MATCH



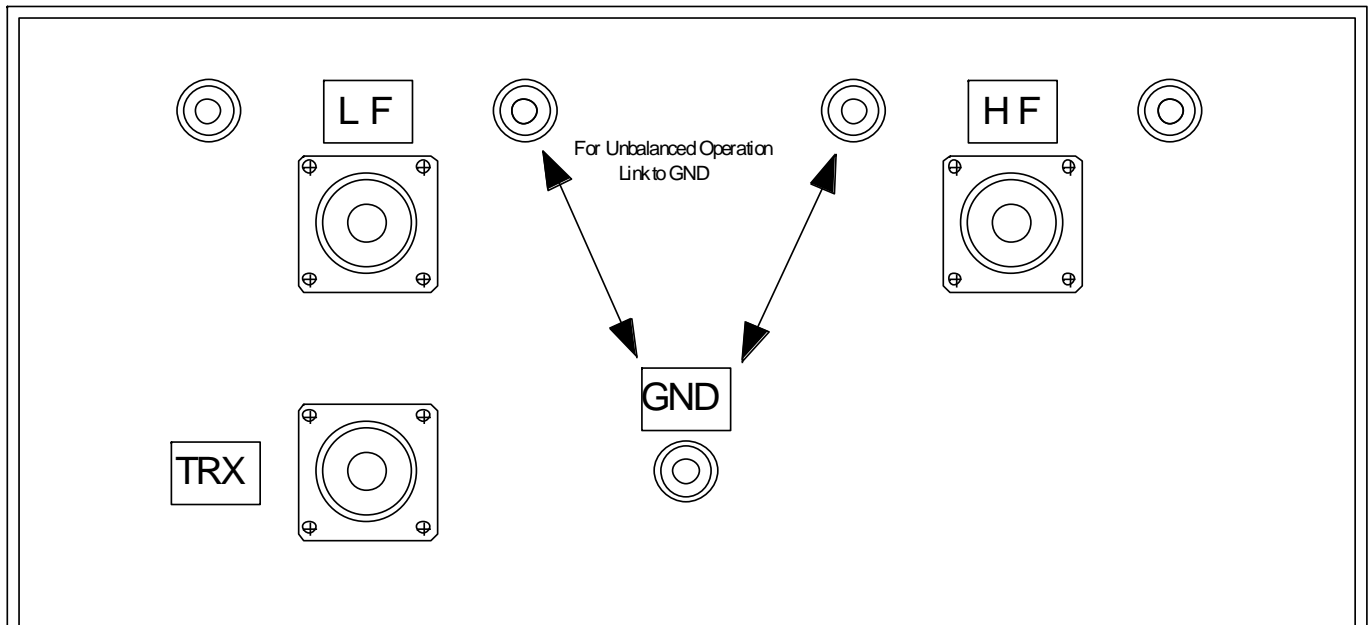
Operating Instructions for
Early and Late Models

Compiled by Pete Sobyte – G0PNM

SEM Z-Match Antenna System Tuning Unit

Early Model

Operating Instructions



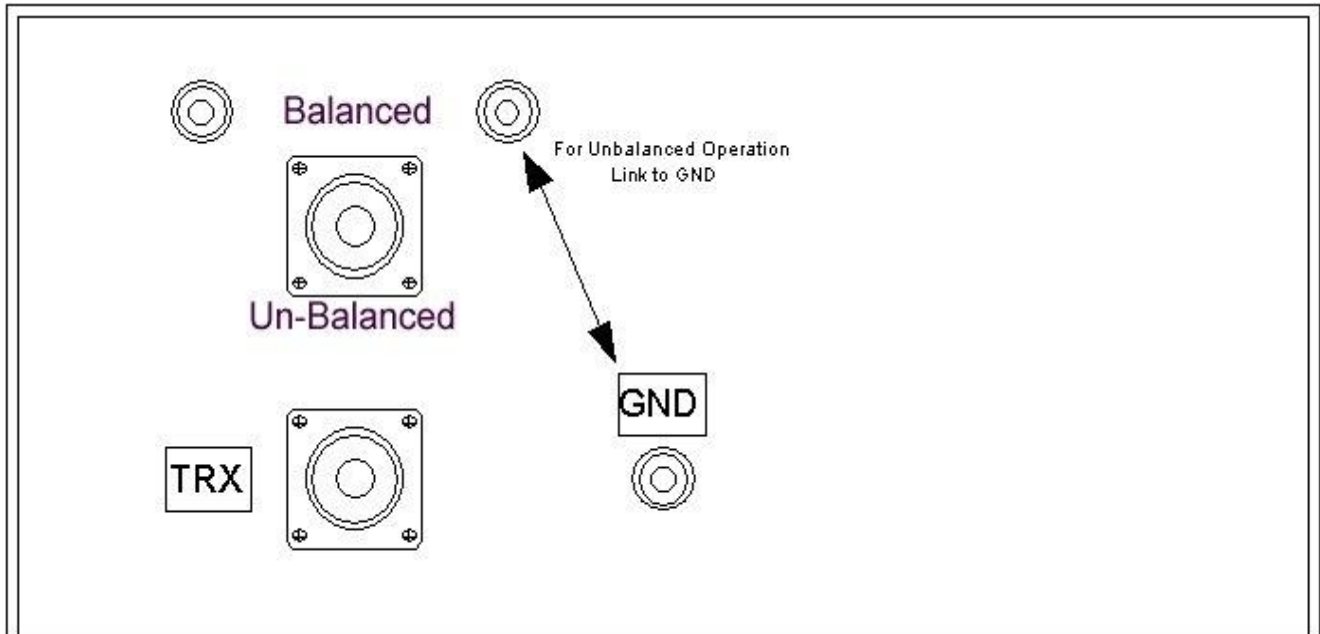
Rear Panel

- 1) Connect transceiver to TRX coaxial connector
- 2) Connect Antenna Twin Feeder to either the LF or HF pair of terminals. Note: - Generally the LF terminals are for 3.5 to 10 Mhz. and the HF terminals 14 to 30 Mhz.
- 3) Apply LOW power initially and alternately adjust the TUNE and COUPLING verniers for minimum reflected power.
Note:- Generally the settings on the Tune vernier will be towards the low end of the range with the exception of 3.5 and 14 Mhz. The setting for the Coupling vernier will depend on the Antenna/Feeder configuration.
- 4) Failure or difficulty to tune on a particular band is usually indicative of an “oddball” antenna/feeder length. Usually lengthening (or shortening) the feeder will solve the problem. **Note: - The power handling capability of the unit is very much dependent on the load. Under normal conditions no flashover should occur when using power levels up to 250 watts. If flashover does occur this is often indicative of trying to load into a very low impedance. An example of this would be trying to use a very short dipole on 3.5 or 7 Mhz.**
- 5) Only one antenna can be connected to the unit at any time.
- 6) For Unbalanced operation, when using an antenna fed via coax, the inner binding posts must be connected to GND as shown.

SEM Z-Match Antenna System Tuning Unit

Late Model

Operating Instructions

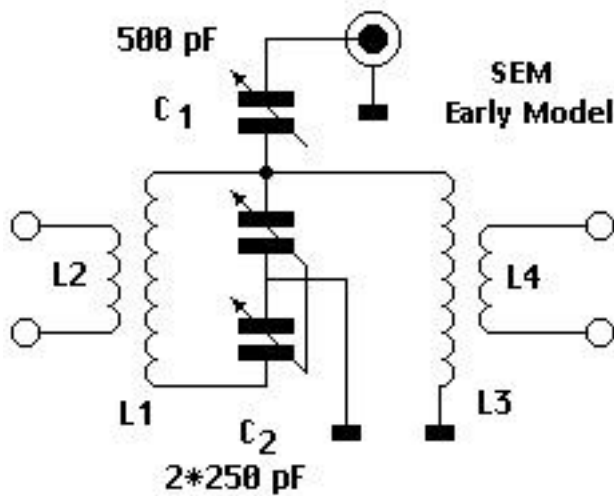


Rear Panel

- 1) Connect transceiver to TRX coaxial connector
- 2) Connect Antenna Twin Feeder to the pair of "banana" terminals.
- 3) Apply LOW power initially and alternately adjust the TUNE and COUPLING verniers for minimum reflected power. **Note:- Generally the settings on the Tune vernier will be towards the low end of the range with the exception of 3.5 and 14 Mhz. The setting for the Coupling vernier will depend on the Antenna/Feeder configuration.**
- 4) Failure or difficulty to tune on a particular band is usually indicative of an "oddball" antenna/feeder length. Usually lengthening (or shortening) the feeder will solve the problem. **Note: - The power handling capability of the unit is very much dependent on the load. Under normal conditions no flashover should occur when using power levels up to 250 watts. If flashover does occur this is often indicative of trying to load into a very low impedance. An example of this would be trying to use a very short dipole on 3.5 or 7 Mhz.**
- 5) Only one antenna can be connected to the unit at any time.
- 6) For Unbalanced operation, when using an antenna fed via coax, the inner binding post must be connected to GND as shown.

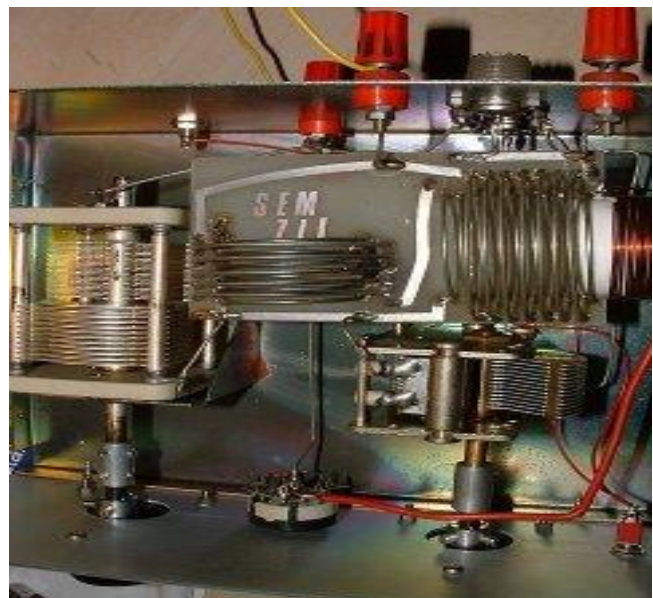
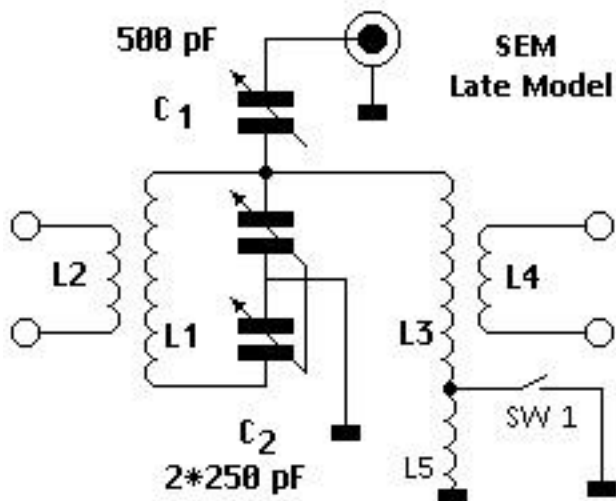
Early Model

The early SEM Tranzmatch used the classic circuit (below) which had two separate outputs L4 (80 and 40M) and L2 (20 to 10M).



Late Model

The later version had a single pair of banana terminals because the two outer coils (L2 and L4) were connected in parallel. (This is shown in the picture but not shown in the circuit below).



The 160M inductor L5 (shown wound on the white former above) was inserted between the end of L3 and ground. The junction of L3 and L5 was grounded via the front panel switch SW1 and would be open for 160M operation.

The other wires running to the switch in the pic are for the Ezitune option.

L5 was about 10 or more turns closewound so that when in series with L3 had sufficient inductance for 160m operation.

S.E.M.

P.O. BOX 6
CASTLETOWN
ISLE OF MAN
Tel. Port Erin (0624) 833714

Manufacturers and Suppliers of Communications Equipment

S.E.M. Z MATCH 80 - 10 METRES

TECHNICAL DATA

Matching range - 15 - 5000 Ohms
Frequency range - 3.5 - 30MHz
Power rating - 1,000 watts into
50 Ohms.
Size: $8\frac{3}{4}$ " x 4" front panel, $7\frac{1}{4}$ " deep.
Weight: 2Kg. (4.4 lbs)
Rear connectors - SO239 from transmitter,
SO239s and 2m.m screw terminals for co-ax
or wire fed aeriels, 2m.m earth terminals.



The S.E.M. Z Match is designed for matching an aerial which can be balanced or unbalanced, into the 50 - 75 Ohms required to terminate correctly modern transmitters and receivers.

It is most important to terminate the modern S.S.B. P.A. stage with the correct non reactive impedance.

The three main reasons are:-

1. The P.A. tank circuit components have a restricted matching range and may not be capable of matching the aerial over the whole band.
2. The P.A. components are rated only for the design output impedance and a high S.W.R. may damage them.
3. If the correct impedance cannot be presented to the P.A. valves, they are either over loaded or under loaded. If they are over loaded, the efficiency decreases and the anodes of the valves overheat. If they are under loaded, the efficiency increases, but the screen current rises to a high value and grid emission results. This is observed as an inability to keep the standing current steady and is only cured with new valves.

If the transmitter is not presented with the correct load, the harmonic output may increase. Not only will the S.E.M. Z Match correct this, but it will also greatly improve the harmonic suppression.

The Z Match circuit is inherently a "balun" so no separate balun is required. The two front panel controls are adjusted to remove the reactance and to adjust the impedance. They are both driven by slow motion drives calibrated in 100 divisions and once the settings have been noted for each band, they can be reset to the correct position when band changing.

S.E.M. Z MATCH INSTRUCTIONS

ANTENNA CONNECTIONS

Connect a co-axial line from the transmitter or receiver to the input socket at the bottom of the Z Match. There is a choice of aerial connections either the coloured plastic terminals or the adjacent coaxial socket may be used depending on the type of aerial in use.

1. 80 or 40 metres - use the black terminals or the adjacent coaxial socket.
2. 20-15 or 10 metres - use the red terminal or their adjacent coaxial socket.

Different types of aerial require different connections as follows:-

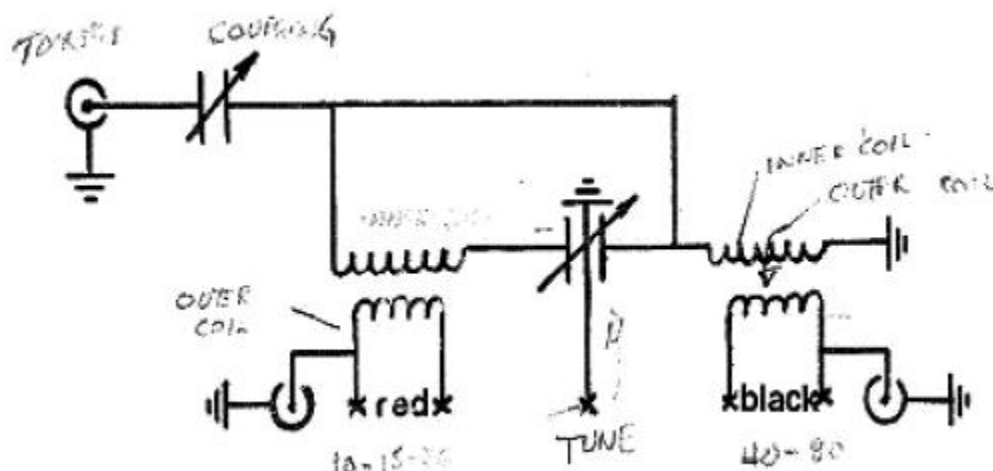
1. Coaxial cable fed aeriels. Plug the aerial into the appropriate (for the band in use) co-ax socket, connect a wire from the plastic terminal to the earth lug.
2. Balance twin feeders. Connect the feeder wires to the appropriate plastic covered terminals. No connection to earth terminal.
3. End fed aeriels. Connect the aerial wire to one of the appropriate terminals. Connect the other terminal to the earth tag.

ADJUSTMENT

Receiving Peak up the two front panel capacitor controls for maximum signal strength on receive.

Transmitting Connect an SWR meter or impedance bridge between the transmitter and the Z Match. Turn the sensitivity control of the bridge to maximum. Put a small amount of R.F. into the system to obtain a reading on the bridge and adjust the controls on the matching unit for minimum reflected power. Increasing the R.F. to maintain a reading on the meter. The transmitter should be adjusted for correct loading after the matching unit has been set correctly. If a double meter SWR bridge is being used, try to ignore the changing reading of the forward meter.

Make a note of the dial readings for each aerial on each band to ease future adjustment.



S.E.M.

UNIT P, UNION MILLS, ISLE OF MAN
Tel: MAROWN (0624) 851277

NEW. S.E.M. QRM ELIMINATOR. Do you suffer from local QRM. Motors, power lines, TVs, local station? We can stop it, with this entirely new concept developed by us. Phase out interference using a small pick up aerial. 1.8-30MHz. **£85 Ex-stock.**

If you don't believe its true, try one for 10 days, if it doesn't solve your problem, we'll refund, less £5 to cover costs. We have many delighted owners now, who can't speak too highly of performance. With comments such as "I can operate for the first time for years" or "you have got a winner".

NEW S.E.M. Dummy load. 100W with dummy load/through switch. So you leave it plugged in. **£22.00 Ex-stock.**

NEW S.E.M. TRANZMATCH. Now has a switch to select DIRECT to aerial, BALANCED or UNBALANCED or DUMMY LOAD. The matching unit retains its tremendous versatility capable of matching virtually any aerial to 50 ohms at up to 1kW, balanced or unbalanced. The link coupled output isolates the aerial from the rig, which can cure TVI both ways. Their robust construction is proved by the ones in daily use for 15 years. 1.8-30MHz £110. Ezitune built in £39.50 (see below). Built in dummy load £8.90 Ex-stock.

S.E.M. 2 metre Transmatch £32.00 Ex-stock.

S.E.M. EZITUNE. Do you use an antenna matcher? You need our Ezitune to tune it to your frequency without transmitting. Listen to the S9+ noise on your receiver and adjust your aerial tuner for a dip in the noise and you are matched up to 50 ohms (1:1 SWR). Protect your radio and stop tuning QRM. **£45** boxed, or p.c.b. + fixing bits and instructions to fit in any A.T.U. **£39.50.** Ex-stock.

VERY WIDE BAND PRE-AMPLIFIERS

They cover from 3-500MHz with a noise figure of 1.5dB and an unprecedented +30dB 3rd order 1P at the INPUT. This means that they are quite exceptional in handling very strong signals, very important on wideband pre-amps. Gain is 9dB.

We make three types. Straight pre-amp, this has a signal loss if you switch it off, **£32.00.** One which switches to "straight through" when switched OFF, can be used for transmitting through (100W) if supplied with 12V on receive and 0 on TX, costs **£35.00.** An R.F. switched unit is **£45.00.** All Ex-stock. We are continuing to make our highly acclaimed dedicated 2 Metre pre-amps with adjustable 0-20dB gain and 1dB N.F. Receive only **£21.90.** R.F. switched **£34.00** and with 240V P.S.U. **£39.00.** Ex-stock.



CONVERTERS for LF, MF, HF, VHF, UHF.

Our new H.F. CONVERTER opens new horizons for receivers, use with the new all mode V.H.F., U.H.F. receivers FRG9600 and ICR7000, extends their coverage down to 100KHz, giving you LF, MF, HF, VHF and UHF. You tune your RX from 100MHz up, e.g. 103.500 is 3.5MHz. It has two aerial sockets, one for H.F. into the converter and one for V/UHF switches straight through into your RX when you switch the converter OFF, i.e. No plugs to change. All this for **£45.00.** Ex-stock.

R.F. NOISE BRIDGE. If you are experimenting with aerials you need one of these units. Tells you the resonant frequency and impedance of your aerials and also invaluable for measuring $\frac{1}{4}$, $\frac{1}{2}$, etc., wavelength of feeders, etc. **£45.00.** Ex-stock.

WAVEMETER. A pretty little absorption wavemeter, to satisfy the licence conditions. 1.5-30MHz with a meter indication. **£39.50.** Ex-stock.

IAMBIC KEYS. We use the world famous CURTIS chip which eliminates the little idiosyncracies common in other keyers. Opto-isolators from the chip ensure that R.F. can't get in, a common problem with multi-chip keyers. **£45.00.** An excellent twin paddle key often mistaken for ones costing several times more at **£19.50.** Ex-stock.

2 METER LINEAR POWER AMP/PRE-AMP. People are constantly telling us that comparing different makes our Pre-amp is best. (See Pre-amps for spec.) Three models. Sentinel 35 12x power gain e.g. 3W IN-36W OUT. Ideal for FT290 **£85.00.** Sentinel 50, 10W IN-50W OUT **£95.00.** Sentinel 100 10W IN-100W OUT **£135.00.** All Ex-stock.

AUDIO MULTIFILTER. Has fully adjustable BAND PASS, HIGH PASS, LOW PASS and 2 NOTCH filters. From 2.5KHz to 20Hz. Making the most versatile filter available. **£75.00.** Ex-stock.

T.V.I. Our Braid Breaker/High Pass Filter cures T.V.I. by plugging into the TV aerial socket. **£7.50.** Ex-stock.

S.E.M. SWITCH. 3 way ant. switch + 4th position to earth. 1kW. S0239S D.C.-150MHz. **£23.00.** Ex-stock.

12 MONTHS COMPLETE GUARANTEE INCLUDING ALL TRANSISTORS.

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