

LINEAR AMPLIFIER MEASUREMENTS

Frequency for single tone measurements: 144.3MHz unless otherwise stated.

Frequencies for two tone measurements: 144.3 and 144.4MHz.

Supply: 13.8vdc

Tono MR-150W Mirage BI016 | MML I44/100S MMLI44/100 LS NOTES

Output for 10w input (single tone) (w)	125	180	100	95 (3w i/p)	
Current drawn from 13.8v supply at this output (a)	14 (FM) 15 (SSB)	24.5	12.5	12.5	
Efficiency (RF power out/DC power in) x 100%	65	53	58	55	
Output for 5w input (single tone) (w)	82 (FM) 86 (SSB)	160	80	85 (1.5w i/p)	
Output for 1w input (single tone) (w)	14.5 (FM) 27.5 (SSB)	43	25	15 (300mW i/p)	
Input VSWR	1.15:1	1.2:1	1.4:1	1.4:1 (3w pos) 1.2:1 (1w pos)	
Output for 10w single tone i/p = 145.5MHz (w)	95 (FM) 100 (SSB)	180	100	90 (1w i/p, 1w pos)	
Output for 10w PEP two tone input (w PEP)	130	180	90	90 (1w i/p 1w pos)	
Average 3rd/5th/7th/9th order intermod at this output (dBc)	-16/-24/ -25/-29	-14/-32/ -40/-41	-16/-29/ -35/-44	-17/-26/ -37/-38	Average of upper & lower products
Output for 5w PEP two tone input (w PEP)	100	160	75	45 (0.5w i/p, 1w pos)	
Average 3rd/5th/7th/9th order intermod at this o/p (dBc)	-23/-33/ -38/-65	-22/-35/ -39/-40	-22/-30/ -40/-47	-26/-36/ -36/-38	
Output for 1w PEP two tone i/p (w PEP)	25	50	25	6 (100mW i/p, 1w pos)	
Average 3rd/5th/7th/9th order intermod at this o/p (dBc)	-29/-37/ -46/-54	-25/-36/ -42/-43	-24/-34/ -45/-48	-28/-31/ -36/-43	
Worst 3rd/5th/7th/9th order intermod with 10w i/p (dBc)	-16/-24/ -25/-29	-14/-32/ -40/-41	-12/-23/ -34/-36	-13/-25/ -29/-35	Worst of upper & lower products
Preamp gain @ 144.000/145.000 / 146.000MHz (dB)	10.7/10.0/ 9.0	9.8/10.2/ 9.8	14.2/14.0/ 13.8	As other MML model	
-3dB (rel. to max gain) points MHz	128/148	141.5/148.5	138.5/150.0	"	
Unity gain points (MHz)	123/153	132/161	119/175	"	
RF level for -20dB 3rd order intermod (mV pd)	112	141	56	"	
RF level for -40dB 3rd order intermod (mV pd)	45	50	25	"	
Through loss (dB)	0.7	0.5	0.4	"	
12dB sinad FM test (uV pd)	0.15	0.13	0.125	0.12	
SSB TX/RX hold time (secs)	None	Variable	0.25	0.25	
RF sensing for SSB	Bad	Excellent	Fair	V. poor	
Overall quality FM	Good	V. good	Excellent	Excellent	
Overall quality SSB	TX fairly good. RX poor.	TX good. RX fairly good.	TX fairly good. RX good.	TX poor. RX good.	

WHAT

The idea of this feature is to provide an easy-to-understand guide to all the currently available wirelesses of interest to the amateur and SWL; we list HF transceivers, VHF transceivers, VHF and UHF hand-helds, mobiles and HF receivers. Where

HF transceivers

Icom IC720A	£690	Good performer; includes general coverage Rx
Icom IC730	£580	Good, aimed at mobile use, but nice
Icom IC740	£720	Lovely rig – see review in Issue 3.
Trio TS530S	£520	Very good rig for the newcomer; reliable
Trio TS830S	£645	We love this one – see our review in Issue 2.
TS930S	£1000 approx	We don't know anyone who has one
Trio TS430S	£736	Very new
Yaesu FT102	£785	Nice – see review in Issue 3.
Yaesu FT980	£1115	New, and we haven't yet seen one
Yaesu FT1	£1349	It's a lot of radio, but a lot of bread
Yaesu FT902DM	£885	Rugged, reliable, nice machine
FT101Z	£559	Has got whiskers now, but a good old rig
FT707	£509	Didn't like this one much, but it's adequate.
Drake TR7A	£1199	A lovely machine, great signal handling
Drake TR5	£657	We'd love to review one . . .

Collins KWM380	£2195	It ought to be good for the price!
KW/Ten-Tec Argosy	£?	A good name, but we don't know the rig.
Yaesu FT77	£?	Replaces FT7B.

VHF transceivers

Trio TS780	£799	Covers 2m and 70cm; good reputation; bit deaf!
Yaesu FT290R	£265	Base-cum-portable 2m rig; see review in May 1983 issue.
Yaesu FT790R	£325	Ditto for 432MHz see review in May 1983 issue.
Trio TR9130	£395	Very nice 144MHz multimode – reliable and solid
Icom IC251E	£559	Good 144MHz multimode, see review in next issue.
Icom IC451E	£689	Ditto for 432MHz
Yaesu FT726	£649	Brand new

VHF and UHF portables

Icom IC2E	£169	Super 144MHz FM handheld; cousin of the IC4E.
		Review in April 1983 issue.
Icom IC4E	£199	We loved this – Review in April 1983 issue.
FDK Palm II	£109	144MHz 6-channel FM hand-held
FDK Palm IV	£109	Ditto for 432MHz
Azden PCS300	£179	144MHz

RADIO?

we know something about the radio we've appended a comment or two - if the column's blank it doesn't mean that we'd be sued if we said what we thought, but that we haven't come across one or heard anything either way about it.

Trio TR2300	£144	handheld; good Rx synthesised	Yaesu FT730R	£285	144MHz mobile/base station (FM)
Trio TR2500	£220	Big portable FM 144MHz box keypad-synthesised	Yaesu 480R	£369	Ditto on 432MHz - 10watts. Rx a bit deaf
Trio TR3500	£250	144MHz handheld; review in April 1983 issue.	Yaesu FT780R	£399	Multimode 144MHz rig; some have had problems
Icom IC202	£209	As above; review in May 1983 issue.	Yaesu FT720	£199/229	Ditto for 432MHz
Icom IC402	£245	SSB 144MHz "portable", still going strong	Icom IC25E	£269	You can get a 144 or 432MHz head for these
Yaesu FT208R	£209	ditto for 432MHz	Icom IC290E	£375	Nice 144MHz FM mobile rig - tiny, two VFOs
Yaesu FT708R	£230	2.5w FM 144MHz hand-held - review in April 1983 issue.	Standard C5800E	£359	144MHz multimode with a 25watt brother (IC290H)
		1w FM 432MHz hand-held - review in April 1983 issue.	KDK FM2030	£199	Lovely 25watt 144MHz multimode
VHF and UHF mobiles			HF receivers		
There are many and they change almost every month, also allow for changes and new introductions.			Trio R1000	£297	Synthesised, good performer
FDK M700AX	£180	144MHz 25watt FM - nice audio and good Rx	Trio R2000	£399	Lots of facilities, See our review in March 1983 issue.
FDK M750AX	£269	144MHz multimode, 10 watts	Icom IC-R70	£499	The old "Frog" Reputedly rather good.
Trio TR7730	£268	25watt 144MHz mobile, nice to use	Yaesu FRG7	£199	Very nice, although not without its faults
Trio TR7800	£257	Much as above only bigger!	Yaesu FRG7700	£330	
Trio TR8400	£299	A mobile 432MHz FM machine, good Rx, apparently	NRD515	£985	
Trio TR9500	£428	Multimode mobile 10watt 432MHz			
Yaesu FT230R	£239	25watts on			

In-Circuit testing

How to make up a simple in-line circuit tester, and use it properly. Check for open and short circuits, front to back ratios, and circuit continuity (switches, fuses, etc) and detecting high resistance soldered joints – most important for home building!

By Brian Kendal, G3GDU.

The author came across this circuit in an old RCA Information Letter dated some 8 years ago, whilst cleaning out an accumulation of old papers.

In the best tradition of do-it-yourself he then proceeded to his radio workshop where a 'breadboard' model was constructed within a few minutes. An hour later, after using the tester on a number of old PCBs, he was fully convinced that the unit has all the advantages claimed. He now intends to fit such a tester permanently within his oscilloscope.

Traditionally, fault finding on de-energised PCB boards has required the desoldering of all but one of the connections to the components under test and then making one or more resistance measurements. This is not only time consuming but also involves application of heat which can cause lifting of PC tracks or perhaps inadvertent destruction of heat-sensitive components before or even after test. As the component packing density of modern equipment increases, so inadvertent damage can also occur to physically adjacent components. Furthermore, an Ohmmeter cannot detect a short-circuit inductor or an open-circuit capacitor and some generate sufficient power, even on their lowest range, to destroy some semi-conductor junctions.

The circuit described is, when used in conjunction with a standard oscilloscope, capable of testing components for short and open-circuit, checking front-to-back ratios on semi-conductors and, by utilising Lissajous and combination patterns on the oscilloscope display, will check reactive components which defy Ohmmeter analysis. The circuit is also useful for checking circuit continuity, (switches, fuses etc) and detecting high resistance soldered joints.

Construction

As may be seen from the circuit diagram the few components are all common items and since all are non critical they may be replaced by whatever suitable parts are immediately available. The transformer is only called upon to supply 10 mA thus may be as small as convenient. Should a transformer be selected whose secondary winding delivers more than 6 volts RMS, then the 560 Ohm resistor should be replaced by a component of somewhat higher value to ensure that the voltage drop across the 100 Ohm resistor remains at 1 volt.

Operation

The oscilloscope leads should be connected to a suitable instrument, and with the test leads short circuited the oscilloscope vertical gain should be adjusted until the trace is almost full scale. Separate the leads and adjust the horizontal gain until the trace is almost full scale. The unit is now ready for operation.

As the diagrams indicate, the tester can clearly indicate a number of different circuit elements including: resistance, semi-conductor junctions, capacitive or inductive reactance. It would therefore be wise for the technician to familiarise himself with the various displays by testing a number of known good and faulty components singly and in various combinations.

When testing transistors, check from base to emitter and to collector separately as a collector to emitter test, being through two back-to-back junctions, would not produce a

The tester's circuit diagram

