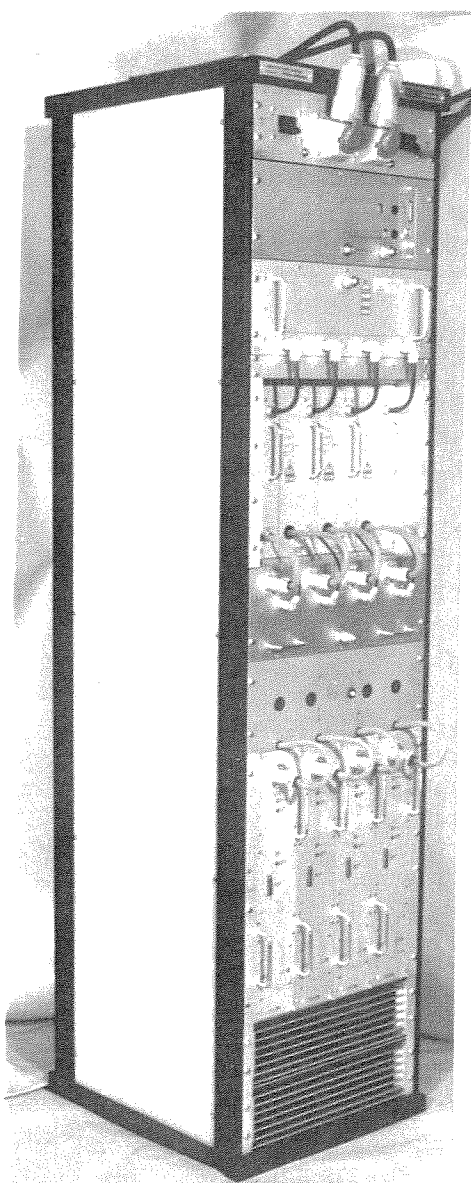




## Band II 2kW Power Amplifier Bays AM14/51A-D, AM14/54 A&B



These FM power amplifier bays consist of four 500 watt broad-band modules (AM14/45), each individually fed from an associated switch-mode power supply (PS2/281). With an appropriate choice of splitting, combining and harmonic filters, the bay may be configured to give four options:-

- |           |   |           |                    |
|-----------|---|-----------|--------------------|
| AM14/51 A | - | 2 kW      | single service bay |
| AM14/51 B | - | 2 x 1 kW  | two service bay    |
| AM14/51 C | - | 4 x 500 W | four service bay   |
| AM14/51 D | - | 2 x 1 kW  | single service bay |

All versions preserve electrical redundancy to aid reliability (A-B working), and are broad-band, operating in the range 88-108 MHz without re-tuning. The RF input power for 2 kW output is 12 W (max), enabling the bay to be driven directly from the 15 W BBC modulator/drive (TM4L/1).

Two other variants, code AM14/54 A and B, are partially equipped bays producing 1 x 1 kW and 2 x 500 W respectively.

In order to achieve a compact, yet cool-running design, the amplifier and power supply were designed to operate at the highest possible efficiency, and this fact coupled with intelligent fan cooling, allows the amplifier to operate at relatively high ambient temperatures without de-rating. The cooling is provided by four DC speed-controlled fans which are under-run at normal ambient temperatures, thus extending fan-life and producing negligible noise.

The 500 W modules operate from 87.5-108 MHz without adjustment. The modules are fully protected against:

- (i) all output mis-match conditions, including infinite VSWR and
- (ii) over-temperature; either fault causes progressive cut-back of RF power to maintain safe operating conditions for the output devices. The output power can be accurately pre-set in the range 300-500 W, and is held constant against variations in drive level or operating frequency by an internal AGC loop.

The module consists of four power output devices operating at high collector efficiency (typically 75 %), configured in two 250 W push-pull pairs, together with driver stages and associated couplers. Generous integral heatsinks, coupled with the high operating efficiency and fan cooling, combine to give an extremely cool running module.

The switching power supplies operate from low-voltage AC derived from dual-screened mains isolating transformers, thus providing a high degree of safety. Additionally, the use of mains input transformers provides good noise rejection and enables a relatively simple yet highly efficient (90 % AC in to DC out) switching regulator to be used. The main 28 V DC outputs are short-circuit and over-voltage protected. Both the power supply and RF amplifier modules contain separate 'A' and 'B' halves to preserve redundancy when operating as a single 500 W transmitter.

The high operating efficiency of both the power amplifiers and suppliers, together with low-loss combiners and filters, enable an overall bay efficiency (mains input to RF Output) well in excess of 50% to be achieved, with a consequent reduction in revenue costs.

Normal operation of the bay is indicated by front-panel status LEDs present on all active modules; more detailed monitoring information is derived using a portable DVM module (ME15P/9). Integral monitoring and remote indications conform to the usual -2, -12 dB format, with the monitoring couplers incorporated as part of the output harmonic filter (FL4/72).

## SPECIFICATION

### Performance Data (2 kW version quoted as typical)

All figures apply anywhere in range 87.5-108 MHz.

#### Inputs

RF	10 W cw 'A' version (2 x 5 W 'B', 4 x 2.5 W 'C'). Return loss $\geq 18$ dB.
Multiplex (optional)	1 V p-p multiplex or 100 mV p-p 19 kHz stereo pilot: locks PSU switching frequency to pilot tone.

#### Outputs

RF	Output power 1.2 - 2.0 kW cw ('A' version), other versions pro-rata
Spurious: harmonic	$\leq -66$ dBc
non-harmonic	$\leq -80$ dBc
Fixed monitoring	Opto-isolator indications of power normal, $\geq +2$ , $\leq -2$ , $\leq -12$ dB

#### Efficiency

Mains inputs to RF output  
55 % typical i.e. 2 x 1.8 kW mains  
inputs for 2 kW output

#### General

Residual AM	$\leq -55$ dB, 50 kHz bandwidth
AM due to FM	$\leq -50$ dB, 75 kHz deviation, 1 kHz rate
Stereo performance	When used in conjunction with BBC drive TM4L/1 no measurable degradation of following parameters: S/N ratio, crosstalk, distortion.
Output power variation with frequency	$\pm 0.2$ dB max.

#### Installation Data

Working ambient	-10 to +50°C
Power requirement	Single phase 190 - 260 V AC twice, 50 Hz 12.5A rms max. each supply. Power factor approx. unity.
Mains protection	15 A thermal circuit-breakers.
Switch-on surge	200 A (max) peak, 2 mS duration, (equivalent to 50 A rms for 1 half cycle), each supply.

Monitoring                      Dedicated digital portable meter  
                                 (ME15P/9).

Mechanical Data

Weight                              ≈ 250 kg

Dimensions (max)                  520 W x 2135 H x 610 D (FW1/15A Bay)

Connectors

    RF in                            Type N fixed socket (A and D)  
                                 Type TNC fixed sockets (B and C),  
                                 and AM14/54 A & B.

    RF out                          Type 7/16 fixed socket(s) AM14/51A,B,D  
                                 Type N fixed socket(s) AM14/51C  
                                 Type 7/16 fixed socket(s) AM14/54A  
                                 Type N fixed socket(s) AM14/54B

    Mains in                        3 pole 16 A fixed plugs (2 off)  
                                 to CEE17 (BS4343).

    MPX in                          BNC fixed socket.

    Monitoring meter              25-way fixed 'D' sockets  
    (ME15P/9)

For further information please refer to DDHB No. 5.161(82) or contact J.B. Sykes,  
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