



**MOTOROLA INC.**

Communications  
Sector

# BASE SITE RF POWER AMPLIFIER

MODEL TLF1302A

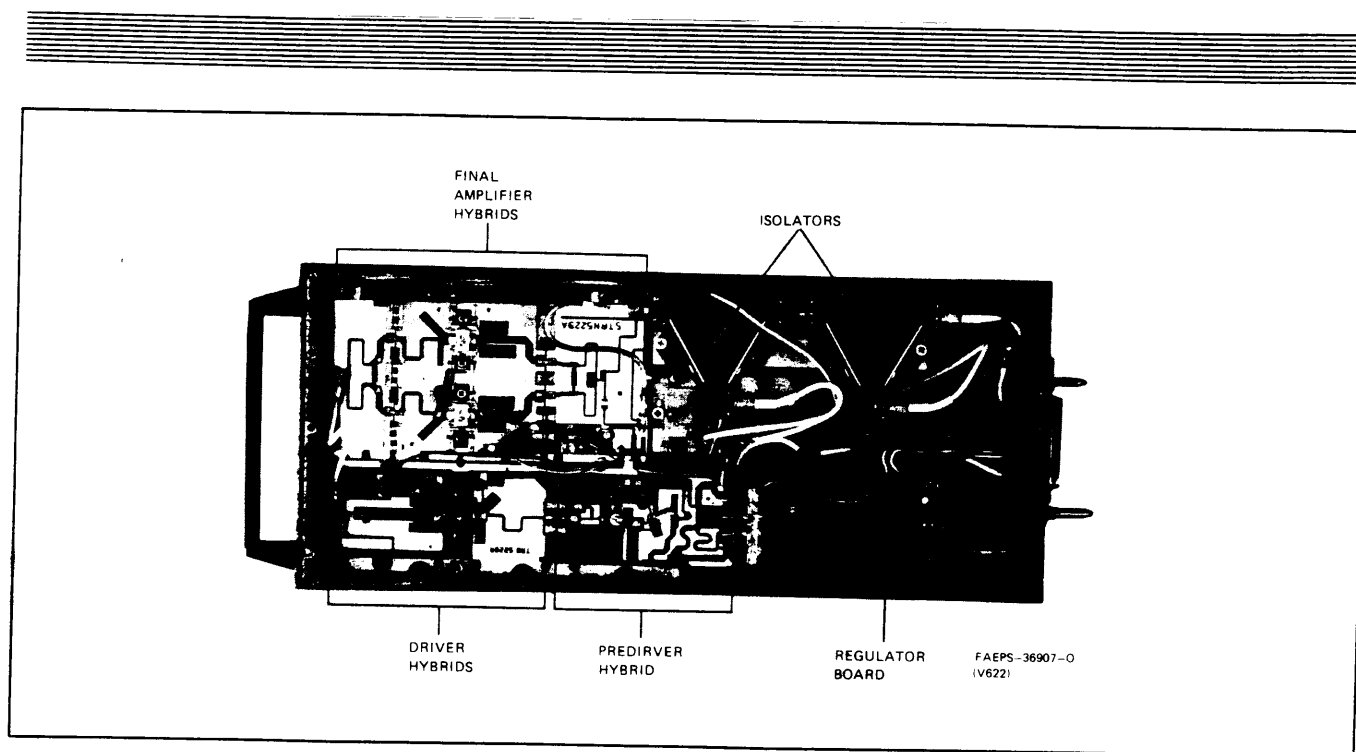


Figure 1. Base Site RF Power Amplifier

## 1. DESCRIPTION

(Refer to Figure 1)

- 1.1 The base site rf power amplifier amplifies the low level rf input signal from the exciter module to approximately 45 watts. The output of each power amplifier (PA) is connected through a cavity filter to the 10-channel junction of the combiner.
- 1.2 The transmitter bay contains three PA housings. Each housing contains three PAs. One housing is mounted at the top of the bay. The other two are mounted at the top and bottom in the rear of the bay.
- 1.3 The rf signal from each exciter module is coupled to a power amplifier via connectors P110/J110 (or P211/J211—refer to Figure 3). The group of three power amplifiers installed in the housing mounted in the

top front of the transmitter bay is connected to the exciter modules through J110. The two other groups located in the rear of the bay are coupled through J211. The outputs are coupled through mini-UHF connectors and N-type connectors.

## 2. FUNCTIONAL THEORY OF OPERATION

- 2.1 Each power amplifier amplifies the rf signal from each exciter to about 45 watts. The following describes the functional theory of a single power amplifier. Refer to Figure 4.
- 2.2 Approximately 1.5 watts of rf power is applied to the input stage, consisting of a predriver and driver. The input stage buffers and delivers drive power

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to the PA final amplifier circuit. This circuit also provides impedance matching between the input and PA final amplifier.

2.3 The PA final amplifier circuit consists of a two-transistor class C stage operating in a parallel configuration. The rf output passes through an isolation circuit to the cavity filter. The isolator protects the final amplifier stage from mismatches at the output connector.

2.4 The regulator circuit consists of a power output regulator and an overvoltage regulator. The overvoltage regulator continuously supplies +25 V dc to the power output regulator and to the driver and final amplifier stages. The power output regulator provides the dc voltage to the predriver stage. The power output regulator also controls the gain of the predriver and maintains the rf power output of the amplifier at the preset level.

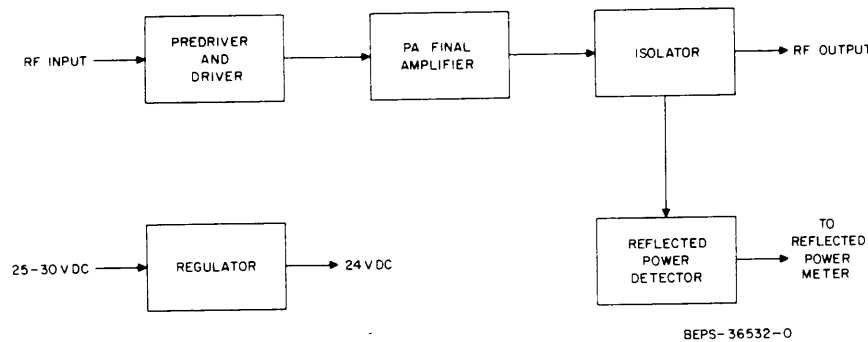


Figure 4. Power Amplifier Block Diagram

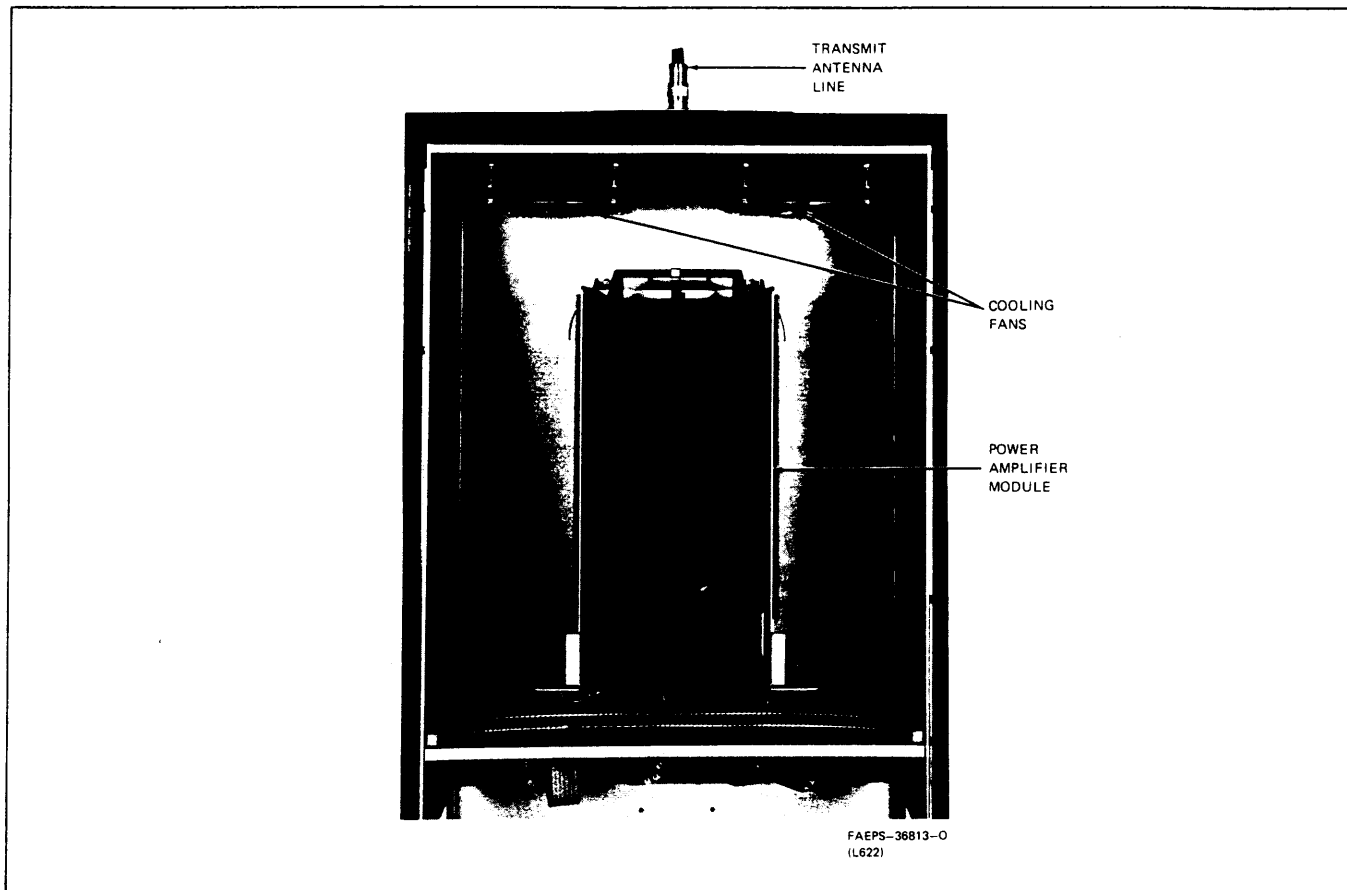
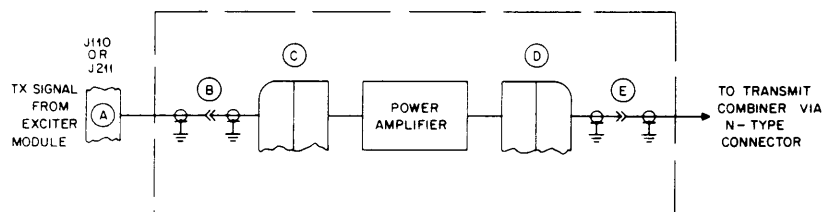


Figure 2. Power Amplifier Mounting  
(Top Front PA Cabinet Shown)



CONNECTOR EXCITER	(A) CANNON	(B) MINI-UHF	(C) CANNON	(D) CANNON	(E) MINI-UHF
SIGNAL	J110-3	J17	P1/J1	J1/P1	J5
00	J110-2	J18	P2/J2	J2/P2	J7
01	J110-1	J19	P3/J3	J3/P3	J9
02	J211-8	J17	P1/J1	J1/P1	J5
03	J211-7	J18	P2/J2	J2/P2	J7
04	J211-6	J19	P3/J3	J3/P3	J9
05	J211-5	J17	P1/J1	J1/P1	J5
06	J211-4	J18	P2/J2	J2/P2	J7
07	J211-3	J19	P3/J3	J3/P3	J9

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Figure 3. Power Amplifier, I/O Block Diagram