

REMOTE PICKUP LINKS AND RF POWER AMPLIFIERS

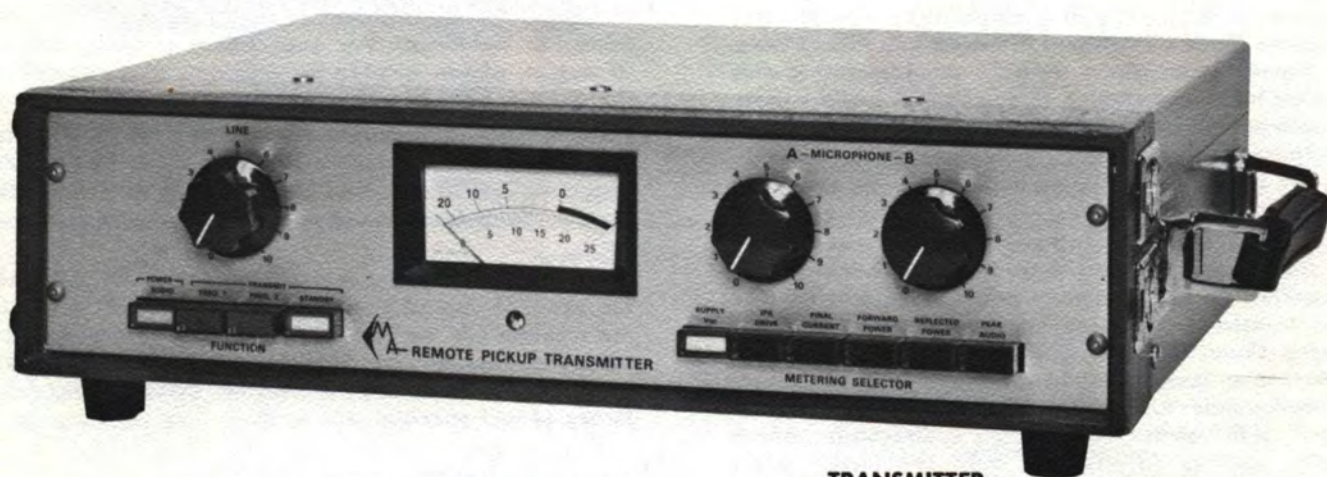


BULLETIN 241D

FOR MOBILE, PORTABLE, AND OUTSIDE BROADCAST SERVICE

MODEL RPL-3 FOR 148-174 MHz

MODEL RPL-4 FOR 450-470 MHz



TRANSMITTER



RECEIVER

FCC TYPE ACCEPTED
MODELS RPL-3A, RPL-4A, RPL-4B
MODELS AMP-3A, AMP-4A

MODELS AMP-3 AND
AMP-4 RF POWER
AMPLIFIERS



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MOSELEY ASSOCIATES, INC.

A FLOW GENERAL COMPANY

featuring a low-profile transmitter, including . . .

- Two-frequency operation
- AC and DC operation
- 3-channel audio mixer
- Audio limiter to prevent overmodulation
- All solid-state circuitry

and companion receiver with . . .

- Minimum rack height requirements
- S-meter for input monitoring
- Remote selection of operating frequency

Compactness and portability characterize the Moseley Associates Models RPL-3 and RPL-4 Remote Pickup Links. The transmitter weighs a mere 16 pounds, and is only 4 inches high — including three-channel audio mixing. The companion receiver occupies only 1 3/4 inches of rack space.

Two full-time microphone input channels and one high-level line input channel are provided by the audio portion of the RPL-3/RPL-4 Transmitter. All input connectors are conveniently located near the front panel of the transmitter. Each microphone preamplifier has its own input transformer, eliminating ground loops and enhancing signal-to-noise ratio. A newly designed peak audio limiter is included in the transmitter to prevent overmodulation. Attack time of the limiter is one millisecond, with release time of 700 milliseconds. Unique circuitry reduces distortion at even the lowest audio frequencies. The limiter has a typical control range greater than 25 dB, relieving the operator from constant varying of audio levels with the changing audio levels associated with remote broadcasts.

Full metering of all important parameters is provided on the transmitter. For monitoring audio levels, a peak audio position is provided. Also, forward power, reflected power, final current, RF drive, and power supply voltage may be observed. Selection is accomplished by unique, color-keyed, front-panel push buttons.

All solid-state circuitry is used throughout the RPL-3/RPL-4 systems. The transmitter employs direct FM voltage-controlled crystal oscillators (VCXO) — circuitry pioneered by Moseley Associates in remote pickup equipment. Two separate oscillators are provided, simplifying dual-frequency operation of the transmitter. The transmitter is comprised of four basic modules; audio, VCXO, multiplier/driver, and RF power amplifier. These may be seen in the photograph below and to



Rear view of Transmitter. Separate fuses and input connectors are provided for AC and DC operation. Note protective cap on DC input. RF output is shown at left.

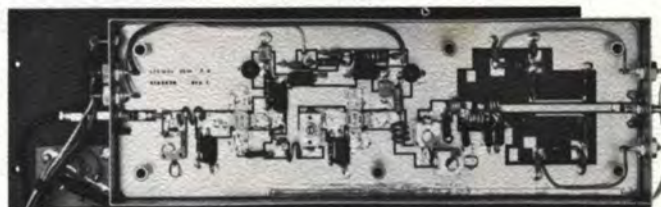
the right. The RF amplifiers of the RPL-3 and RPL-4 use microstrip techniques. For applications requiring higher RF output, please refer to the overleaf, which describes the Model AMP-3/AMP-4 RF Power Amplifiers.

The RPL-3/RPL-4 Receivers are of the superheterodyne design and employ double conversion. I.F. frequencies employed are 30 MHz and 10.7 MHz. An all solid-state squelch circuit is employed and has an adjustable threshold.

Optionally, a carrier-operated relay can be supplied for external control purposes. As with the transmitter, the receiver can be operated on dual frequencies. Provisions are incorporated for remote selection of receiver frequency. The RPL-3/RPL-4 Receiver occupies only 1 3/4 inches of rack space.

ORDERING INFORMATION

Please specify exact RF operating frequency. For the RPL-4, specify 5 kHz or 10 kHz deviation. Options include crystal set for dual-frequency operation and carrier-operated relay for receivers.

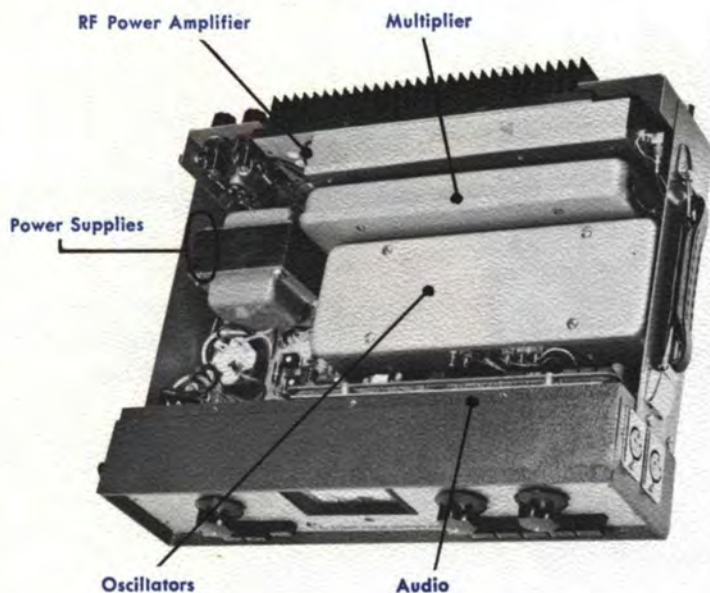


Interior view of the RPL-3 Transmitter RF Amplifier showing microstrip printed circuit technique used. This single unit amplifies the 160 MHz signal from 100 milliwatts to 10 watts.

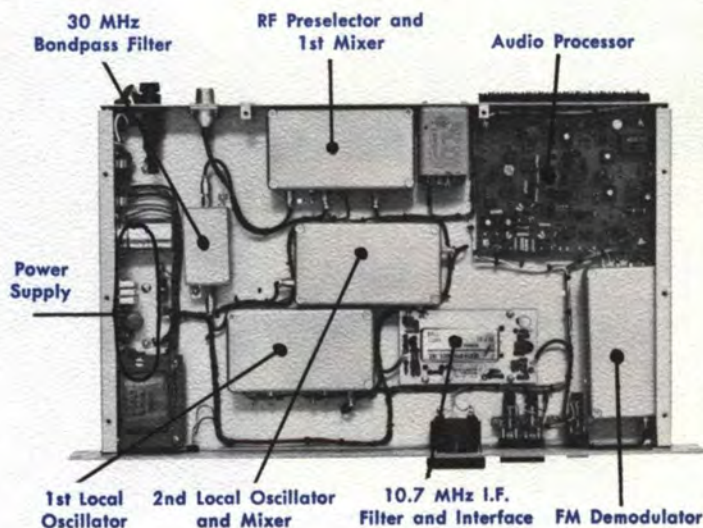


Rear view of Receiver. Barrier strip provides for remote selection of operating frequencies and audio output.

RPL-SERIES TRANSMITTER



RPL-SERIES RECEIVER



Top view — RPL-3 Transmitter and Receiver. Note individual module concept. Each subassembly is completely shielded from all others. Easy access is afforded to all circuitry.

specifications

system

Audio Response	±1.5 dB, 30 Hz - 10,000 Hz ***
Distortion	Less than 1.3% at 1,000 Hz
Signal-to-Noise Ratio	55 dB below 100% (60 dB typical)

transmitter

RF Output	13 watts maximum, 10 watts nominal, into 50 ohm load, at 13.5 VDC. Output connector Type BNC female.
VSWR Protection	Withstands infinite VSWR at all phase angles.
Deviation *	
RPL-3	±5 kHz (30F3)
RPL-4	±5 kHz (30F3) or ±10 kHz (40F3)
Frequency Stability	0.00025% (-30°C to 50°C)
Harmonic Spurious Output	Better than 60 dB below carrier
Operating Temperature Range	-30°C to 50°C
Audio Inputs	3 independent channels (2 microphone, 1 line)
Audio Input Impedances	
Line	-15 dBm to +10 dBm from 600Ω source
Microphone	-60 dBm to -40 dBm
Audio Peak Limiter	Control range greater than 25 dB, attack time one millisecond, release time 700 milliseconds.
Metering	Peak Audio, Forward RF Power, Reflected RF Power, Final Amplifier Current, I.P.A. RF Drive, and Power Supply Voltage.
Power Requirements	
AC	120/240 VAC ± 10%, 50-60 Hz, 50 watts maximum
DC	13.5 VDC, negative ground, 2A maximum; 15 VDC maximum, 12 VDC minimum
Size	4" (10.2 cm)H x 14 1/2" (36.8 cm)W x 11" (27.9 cm)D
Weight (Net)	16 pounds (7.2 kg)

Frequency Range *

RPL-3	148-174 MHz
RPL-4	450-470 MHz

Two-frequency operation within 1 MHz spacing. One set of crystals supplied with link; order second set of crystals for two-frequency operation.

Audio Monitoring

Utility output with internal adjustable gain control for feeding headphones, telephone line, or other monitor audio amplifiers. Output 600Ω, unbalanced, +10 dBm nominal.

Sensitivity

RPL-3/RPL-4 1 microvolt for 20 dB quieting

Selectivity *

RPL-3 & RPL-4 (5 kHz Deviation)	-6 dB at ±22 kHz
RPL-4 (10 kHz Deviation)	-60 dB at ±42 kHz
	-6 dB at ±44 kHz
	-60 dB at ±75 kHz

All Spurious Response

65 dB below carrier

Frequency Stability

0.0005% (-20°C to 60°C)

RF Input

50Ω, unbalanced, input connector Type UHF female for RPL-3, Type N for RPL-4

Audio Output

+10 dBm @ 100% modulation, 600Ω, balanced

Squelch

Automatic and adjustable, electronic. Carrier-operated relay output (Form C contacts) optionally available.

Operating Temperature Range

-20°C to 60°C

Power Requirements

120/240 VAC ± 10%, 50-60 Hz, 10 watts
1 3/4" (4.5 cm)H x 19" (48.4 cm)W x 10" (25 cm)D

Weight (Net)

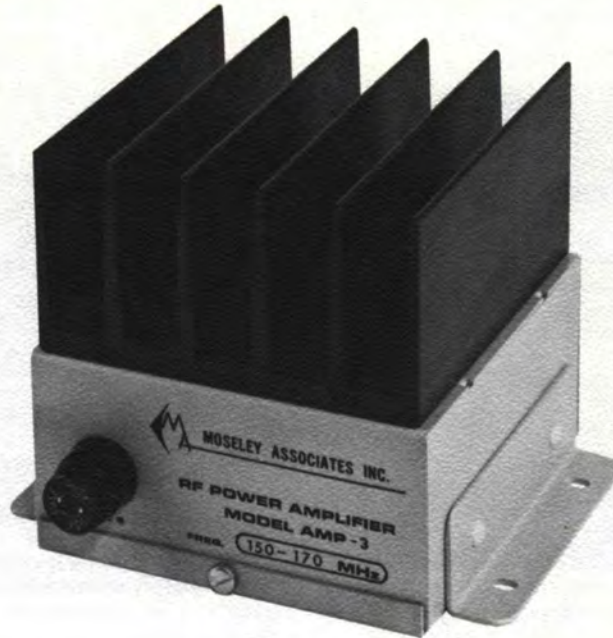
10 pounds (4.5 kg)

*FCC users see type accepted addendum

**Audio response extended to 15,000 Hz on special order. RF bandwidths similar to RPL-4 requiring a minimum of 50 kHz channel spacing.

Specifications subject to change without notice

MODELS AMP-3 and AMP-4 POWER AMPLIFIERS



**FCC TYPE ACCEPTED
MODELS: AMP-3A,
AMP-4A**

When greater RF outputs are required from the RPL-3 and RPL-4 transmitters to extend their operational range, the **Models AMP-3 and AMP-4 RF Power Amplifiers** may be added. These fully self-contained amplifiers will increase the RF output nominal gain of their companion remote pickup transmitter. Power gains provided by AMP-3 and AMP-4 are typically 6 dB and 5 dB, respectively. The only power requirement is 13.5 VDC. No direct control is required. The application

of RF drive activates the RF power amplifier, with less than 5 ma current drawn during non-operating periods. **No adjustments** are provided or required in the AMP-3 or AMP-4. Both units are constructed using wideband microstrip techniques. These Power Amplifiers are also available rack mounted (19" rack, 5.25"/13.4 cm H) with ventilation fan and AC power supply (120/240 VAC, 50/60 Hz). Specify Models AMP-3A/AC or AMP-4A/AC.

specifications

	AMP-3	AMP-4
Frequency Range *	148-174 MHz	450-470 MHz
RF Power Input, Maximum	13 watts	10 watts
RF Input Connector	Type BNC, female	Type BNC, female
Nominal Gain	6 dB (@ 13.5 VDC)	5 dB (@ 13.5 VDC)
RF Output Connector	Type UHF, female (SO-239 Series)	Type N, female
RF Output Impedance	50Ω, unbalanced	50Ω, unbalanced
VSWR	Withstands infinite VSWR at all phase angles	Withstands infinite VSWR at all phase angles
Efficiency	60% minimum	60% minimum
Harmonic Suppression	57 dB below carrier	57 dB below carrier
Spurious Output	60 dB below carrier	60 dB below carrier
Power Requirement	11-15 VDC, negative ground	11-15 VDC, negative ground
Duty Cycle	Continuous at 10 watts input - 50°C ambient	Continuous at 10 watts input - 50°C ambient
Mounting	Not critical. Position unit so as to provide adequate ventilation, with heat sink fully exposed (not inverted).	Not critical. Position unit so as to provide adequate ventilation, with heat sink fully exposed (not inverted).
Size	4" (10.2 cm)H x 5.5" (14 cm)W x 4.5" (11.4 cm)D	4" (10.2 cm)H x 5.5" (14 cm)W x 4.5" (11.4 cm)D
Weight (Net)	5 lbs. (2.3 kg)	5 lbs. (2.3 kg)

*FCC users see type accepted addendum Specifications subject to change without notice



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