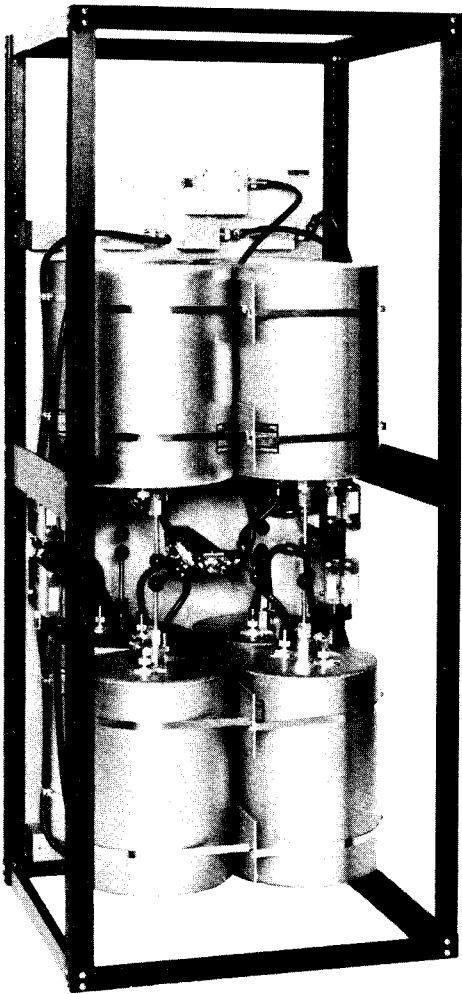


Low Loss Transmitter Combiners



7Z344 8 × 8 shown with optional
L1960 rack and power meter panel

- Field Expandable
- Panel Mounted
- Close Frequency Spacing
- VHF and UHF
- Low Loss
- Power Monitoring Optional
- Field Tuneable

Microwave Associates Low Loss Combiners are panel mounted for use in standard relay racks, cabinets or optional free standing racks. This modular concept and design allows easy in-the-field expansion at low cost. The use of broadband circulators allows changes in the field with only simple retuning of the cavity.



M/A-COM LAND MOBILE COMMUNICATIONS INCORPORATED

SPECIFICATIONS:

| VHF | | Two Channel Expandable To Four | | | | | | Narrow Space | | Low Power | | |
|------------------------|-------------------|--------------------------------|--------|-------------------|-----------------------|-----------------------|-------------------|--------------|--------------|------------|-----------------|-------------|
| Number of Transmitters | Freq. Range (MHz) | Typical Isolation (dB) | | Insertion Loss dB | Min. Freq. Separation | Max. Power Each Chan. | Attenuation* (dB) | Input VSWR | Temp °C | Connectors | Size | Model |
| | | Tx-Tx | Ani-Tx | | | | | | | | | |
| 2 | 145-174 | 70 | 60 | 3.3 | 175KHz | 125W | 80 | 1.25:1 | -30° to +70° | N Female | 19 x 33.25 x 20 | 7Z412-2 x 4 |
| 3 | 145-174 | 70 | 60 | 3.3 | 175KHz | 125W | 80 | 1.25:1 | -30° to +70° | N Female | 19 x 33.25 x 20 | 7Z412-3 x 4 |
| 4 | 145-174 | 70 | 60 | 3.3 | 175KHz | 125W | 80 | 1.25:1 | -30° to +70° | N Female | 19 x 33.25 x 20 | 7Z412-4 x 4 |

| VHF | | Two Channel Expandable To Eight | | | | | | Narrow Space | | Low Power | | |
|------------------------|-------------------|---------------------------------|--------|-------------------|-----------------------|-----------------------|-------------------|--------------|--------------|------------|----------------|-------------|
| Number of Transmitters | Freq. Range (MHz) | Typical Isolation (dB) | | Insertion Loss dB | Min. Freq. Separation | Max. Power Each Chan. | Attenuation* (dB) | Input VSWR | Temp °C | Connectors | Size | Model |
| | | Tx-Tx | Ani-Tx | | | | | | | | | |
| 2 | 145-174 | 70 | 60 | 3.3 | 175KHz | 125W | 80 | 1.25:1 | -30° to +70° | N Female | 19 x 66.5 x 20 | 7Z412-2 x 8 |
| 3 | 145-174 | 70 | 60 | 3.3 | 175KHz | 125W | 80 | 1.25:1 | -30° to +70° | N Female | 19 x 66.5 x 20 | 7Z412-3 x 8 |
| 4 | 145-174 | 70 | 60 | 3.3 | 175KHz | 125W | 80 | 1.25:1 | -30° to +70° | N Female | 19 x 66.5 x 20 | 7Z412-4 x 8 |
| 5 | 145-174 | 70 | 60 | 3.3 | 175KHz | 125W | 80 | 1.25:1 | -30° to +70° | N Female | 19 x 66.5 x 20 | 7Z412-5 x 8 |
| 6 | 145-174 | 70 | 60 | 3.3 | 175KHz | 125W | 80 | 1.25:1 | -30° to +70° | N Female | 19 x 66.5 x 20 | 7Z412-6 x 8 |
| 7 | 145-174 | 70 | 60 | 3.3 | 175KHz | 125W | 80 | 1.25:1 | -30° to +70° | N Female | 19 x 66.5 x 20 | 7Z412-7 x 8 |
| 8 | 145-174 | 70 | 60 | 3.3 | 175KHz | 125W | 80 | 1.25:1 | -30° to +70° | N Female | 19 x 66.5 x 20 | 7Z412-8 x 8 |

| UHF | | Two Channel Expandable To Four | | | | | | Wide Space | | Low Power | | |
|------------------------|-------------------|--------------------------------|--------|-------------------|-----------------------|-----------------------|-------------------|------------|--------------|------------|----------------|-------------|
| Number of Transmitters | Freq. Range (MHz) | Typical Isolation (dB) | | Insertion Loss dB | Min. Freq. Separation | Max. Power Each Chan. | Attenuation* (dB) | Input VSWR | Temp °C | Connectors | Size | Model |
| | | Tx-Tx | Ani-Tx | | | | | | | | | |
| 2 | 450-512 | 70 | 60 | 3.0 | 500KHz | 125W | 80 | 1.25:1 | -30° to +70° | N Female | 19 x 24.5 x 20 | 7Z348-2 x 4 |
| 3 | 450-512 | 70 | 60 | 3.0 | 500KHz | 125W | 80 | 1.25:1 | -30° to +70° | N Female | 19 x 24.5 x 20 | 7Z348-3 x 4 |
| 4 | 450-512 | 70 | 60 | 3.0 | 500KHz | 125W | 80 | 1.25:1 | -30° to +70° | N Female | 19 x 24.5 x 20 | 7Z348-4 x 4 |

| UHF | | Two Channel Expandable To Four | | | | | | Narrow Space | | High Power | | |
|------------------------|-------------------|--------------------------------|--------|-------------------|-----------------------|-----------------------|-------------------|--------------|--------------|------------|-----------------|-------------|
| Number of Transmitters | Freq. Range (MHz) | Typical Isolation (dB) | | Insertion Loss dB | Min. Freq. Separation | Max. Power Each Chan. | Attenuation* (dB) | Input VSWR | Temp °C | Connectors | Size | Model |
| | | Tx-Tx | Ani-Tx | | | | | | | | | |
| 2 | 450-512 | 70 | 60 | 3.0 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 22.75 x 22 | 7Z344-2 x 4 |
| 3 | 450-512 | 70 | 60 | 3.0 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 22.75 x 22 | 7Z344-3 x 4 |
| 4 | 450-512 | 70 | 60 | 3.0 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 22.75 x 22 | 7Z344-4 x 4 |

| UHF | | Two Channel Expandable To Eight | | | | | | Narrow Space | | High Power | | |
|------------------------|-------------------|---------------------------------|--------|-------------------|-----------------------|-----------------------|-------------------|--------------|--------------|------------|-----------------|-------------|
| Number of Transmitters | Freq. Range (MHz) | Typical Isolation (dB) | | Insertion Loss dB | Min. Freq. Separation | Max. Power Each Chan. | Attenuation* (dB) | Input VSWR | Temp °C | Connectors | Size | Model |
| | | Tx-Tx | Ani-Tx | | | | | | | | | |
| 2 | 450-512 | 70 | 60 | 3.0 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 45.50 x 22 | 7Z344-2 x 8 |
| 3 | 450-512 | 70 | 60 | 3.0 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 45.50 x 22 | 7Z344-3 x 8 |
| 4 | 450-512 | 70 | 60 | 3.0 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 45.50 x 22 | 7Z344-4 x 8 |
| 5 | 450-512 | 70 | 60 | 3.0 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 45.50 x 22 | 7Z344-5 x 8 |
| 6 | 450-512 | 70 | 60 | 3.0 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 45.50 x 22 | 7Z344-6 x 8 |
| 7 | 450-512 | 70 | 60 | 3.0 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 45.50 x 22 | 7Z344-7 x 8 |
| 8 | 450-512 | 70 | 60 | 3.0 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 45.50 x 22 | 7Z344-8 x 8 |

| UHF | | Two Channel Expandable To Four | | | | | | Narrow Space | | High Power | | |
|------------------------|-------------------|--------------------------------|--------|-------------------|-----------------------|-----------------------|-------------------|--------------|--------------|------------|-----------------|-------------|
| Number of Transmitters | Freq. Range (MHz) | Typical Isolation (dB) | | Insertion Loss dB | Min. Freq. Separation | Max. Power Each Chan. | Attenuation* (dB) | Input VSWR | Temp °C | Connectors | Size | Model |
| | | Tx-Tx | Ani-Tx | | | | | | | | | |
| 2 | 450-512 | 95 | 85 | 3.5 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 22.75 x 22 | 7Z522-2 x 4 |
| 3 | 450-512 | 95 | 85 | 3.5 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 22.75 x 22 | 7Z522-3 x 4 |
| 4 | 450-512 | 95 | 85 | 3.5 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 22.75 x 22 | 7Z522-4 x 4 |

| UHF | | Two Channel Expandable To Eight | | | | | | Narrow Space | | High Power | | |
|------------------------|-------------------|---------------------------------|--------|-------------------|-----------------------|-----------------------|-------------------|--------------|--------------|------------|-----------------|-------------|
| Number of Transmitters | Freq. Range (MHz) | Typical Isolation (dB) | | Insertion Loss dB | Min. Freq. Separation | Max. Power Each Chan. | Attenuation* (dB) | Input VSWR | Temp °C | Connectors | Size | Model |
| | | Tx-Tx | Ani-Tx | | | | | | | | | |
| 2 | 450-512 | 95 | 85 | 3.5 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 45.50 x 22 | 7Z522-2 x 8 |
| 3 | 450-512 | 95 | 85 | 3.5 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 45.50 x 22 | 7Z522-3 x 8 |
| 4 | 450-512 | 95 | 85 | 3.5 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 45.50 x 22 | 7Z522-4 x 8 |
| 5 | 450-512 | 95 | 85 | 3.5 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 45.50 x 22 | 7Z522-5 x 8 |
| 6 | 450-512 | 95 | 85 | 3.5 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 45.50 x 22 | 7Z522-6 x 8 |
| 7 | 450-512 | 95 | 85 | 3.5 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 45.50 x 22 | 7Z522-7 x 8 |
| 8 | 450-512 | 95 | 85 | 3.5 | 300KHz | 200W | 80 | 1.25:1 | -30° to +70° | N Female | 24 x 45.50 x 22 | 7Z522-8 x 8 |

*Harmonics and IM Products

OPTIONS:

FIELD EXPANSION KITS

| Model | Description |
|----------|-----------------------------------|
| 7Z 412-1 | Add on Kit for any 7Z412 Combiner |
| 7Z 348-1 | Add on Kit for any 7Z348 Combiner |
| 7Z 344-1 | Add on Kit for any 7Z344 Combiner |
| 7Z 522-1 | Add on Kit for any 7Z522 Combiner |

Each Kit contains all hardware and components necessary to add one transmitter to existing combiner in the field.

RACKS

| Model | Description | Overall Size | Panel Space |
|-------|--------------------------|------------------|-------------|
| L1960 | 24 in Free Standing Rack | 60 x 25.5 x 25.5 | 54.0 x 24 |
| L2276 | 24 in Relay Rack | 67.5 x 25.5 x 15 | 62.5 x 24 |
| L2278 | 24 in Relay Rack | 81.5 x 25.5 x 15 | 76.5 x 24 |
| L2424 | 19 in Relay Rack | 81.5 x 20.5 x 15 | 76.5 x 19 |

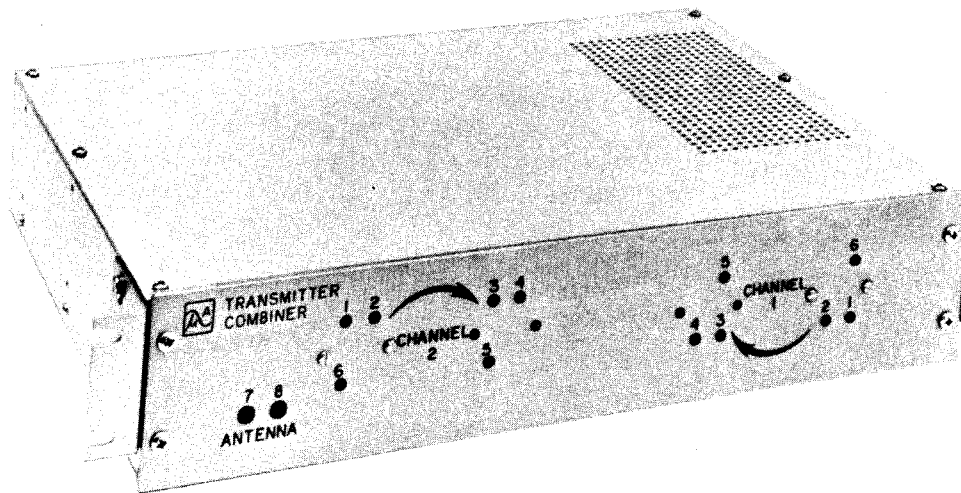
Please consult with factory for other combining configurations not shown and for additional information regarding power monitoring options, receiver combining applications and the complete line of I.M. suppression products available.

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All specifications are subject to change without notice.

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COMBINERS TO SUPPRESS INTERMODE PRODUCTS



**H-2065T, H-2065T/B,
H-2093T, H-2093T/B**

Microwave Associates' communications bands two channel transmitter combiners permit the combining of two transmitters to a single antenna regardless of frequency separation. Antenna sharing eliminates multiple antenna installations and the problems involved with physical separation of the antennae.

These 125-watt combiners cover both high band (H-2093T) and UHF (H-2065T) while providing 65 dB inter-transmitter isolation with typical insertion loss of 4.1 dB.

Both models are tunable within their frequency ranges to accept a mismatch of up to 1.5:1. To provide high isolation, both combiners are customer tunable to specific transmitter frequencies.

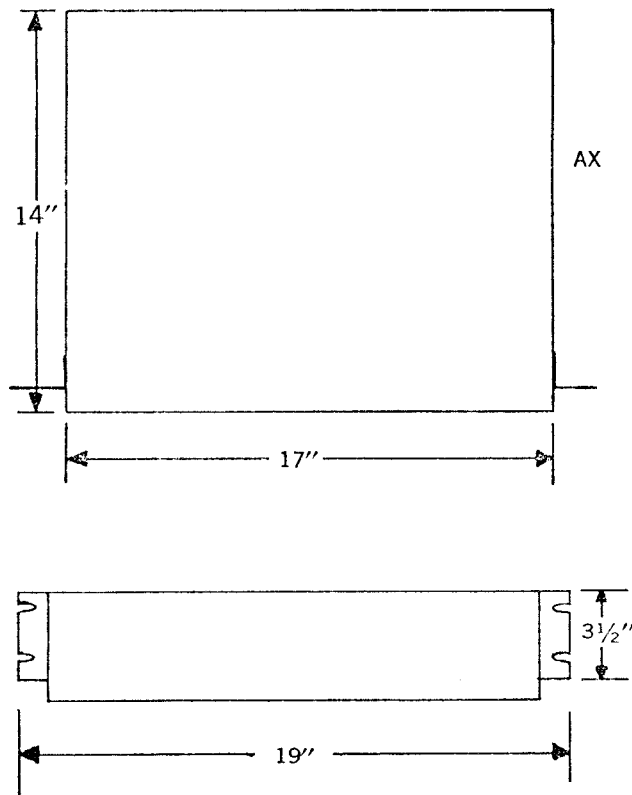
These combiners are representative of Microwave Associates' capabilities. Many variations in electrical and mechanical characteristics are possible to suit this component to a customer's specific requirements. Inquiries are invited.



ELECTRICAL CHARACTERISTICS

| | H-2093T | H-2093/B | H-2065T | H-2065T/B |
|--|-------------|-------------|-------------|-------------|
| Frequency range | 145-174 MHz | 145-174 MHz | 450-470 MHz | 450-470 MHz |
| Isolation | | | | |
| Tx to Tx | 70 dB | 100 dB | 70 dB | 100 dB |
| Antenna to Tx | 33 dB | 65 dB | 33 dB | 65 dB |
| Insertion Loss | 4.1 dB | 4.5 dB | 4.1 dB | 4.5 dB |
| Attenuation, harmonics and intermod products | 65 dB | 65 dB | 65 dB | 65 dB |
| Maximum power input (per channel) | 125 watts | 125 watts | 125 watts | 125 watts |
| Input VSWR (ref. 50 ohms) ... | 1.25 to 1 | 1.25 to 1 | 1.25 to 1 | 1.25 to 1 |
| Maximum Tx to Tx frequency separation | 1 MHz | 1 MHz | 1 MHz | 1 MHz |
| Temperature range | -30°to+60°C | -30°to+60°C | -30°to+60°C | -30°to+60°C |
| Connectors | N Female | N Female | N Female | N Female |

MECHANICAL CHARACTERISTICS



CIRCUIT BLOCK DIAGRAM

