



COLLINS transhorizon  
systems

# 1,000 MC SYSTEMS

**240D 10 KW POWER AMPLIFIERS** — The 240D-1 provides a 10 kw FM output in the 755-985 mc frequency range. The 240D-2 provides a 10 kw output power in the 400-550 mc range. The 310K Exciter-Modulator may be used to supply the drive requirements for the 240D-1. *Output Impedance:* 50 ohms. *Drive Power:* 0.1 watts nominal, for 240D-1; 12 watts for 240D-2. *Residual AM:* More than 50 db below carrier. *Harmonic Output:* Following low pass filter, all spurious and harmonic output frequencies are at least 83 db below carrier level. *Primary Power:* 208 v  $\pm 10\%$ , 60 +3 -10 cps, 3 phase, 45 kva.

**240E-2 1 KW POWER AMPLIFIER** — Operates in the 755-985 mc frequency range with output power of 1 kw nominal or 2 kw maximum. Minimum gain is 30 db at a bandwidth of 2 mc. May be driven by 310K Exciter-Modulator. *Output Impedance:* 50 ohms. *Drive Power:* 3 watts nominal. *Residual AM:* More than 50 db below carrier. *Harmonic Output:* Following low pass filter, all spurious output at least 83 db below carrier level. *Primary Power:* 208 v, +3 -10 cps, 3 phase, 4 wire, 8 kw with 2 kw output, 6 kw with 1 kw output.

**651C SERIES RECEIVERS** — Will accommodate up to 24 voice channels with dual diversity reception on any frequency in the 755-985 mc range. Type numbers and channel capacities in this series are: 651C-1, 24 channels; 651C-2, 4; and 651C-3, 12. Two 651C Receivers may be paralleled for quadruple diversity operation. *Noise Figure:* 8 db or better. *Spurious Response:* 60 db down except 1st injection image, which is 45 db. *Input Impedance:* 50 ohms. *Output Impedance:* 600, 270 or 135 ohms. *Primary Power:* 120 v, 60 +3 -10 cps, 975 va.

**310K-2, -3 EXCITER-MODULATORS** — The 310K provides a phase modulated output in the 755 to 985 mc range for driving 240D-1 or 240E-2 Power Amplifiers. The modulator baseband extends from 250 cps to 112 kc. Adjustable power output level is 10 watts nominal into a 50 ohm load. A baseband level panel for use at relay stations is included in the 310K-2. *Frequency Stability:*  $\pm .001\%$ , 0° to 45°C. *Emission:* CW or FM. *Maximum Deviation:*  $\pm 336$  kc. *Frequency Response:*  $\pm 1$  db. *Channel Capacity:* 1 to 24, depending on

multiplex terminal equipment. *Modulation Input Impedance:* 600 or 135 ohms balanced or single ended. *Modulation Input Level:* -20 dbm or less per channel. *Incidental FM:* 75 db below maximum deviation. *Spurious Output:* More than 60 db below the carrier level. *Power Input:* 120 v, 50/60 cps, 600 va.

**537J AIR INFLATABLE ANTENNAS** — A 15 foot parabolic antenna for transportable Transhorizon systems. The 537J-1 is used in the 755 mc to 985 mc range; the 537J-2 in the 1700 mc to 2400 mc range; and 537J-3 in the 350 mc to 600 mc range. Each can be roof mounted or provided with an auxiliary guyed tower which elevates the axis of the antenna to a maximum height of 22½ ft. Track rings allow full 360° azimuth adjustment. A self-contained blower inflates the reflector in 15 minutes and automatically maintains proper pressure. An accessory erection kit is available to facilitate installation. *Power Gain:* Above an isotropic antenna in 350 mc to 600 mc range, 22 db; in 755 mc to 985 mc range, 29 db; and in 1700 mc to 2400 mc range, 36 db. *Horn Power Rating:* One kw continuous. *Wind Loading:* 100 mph.

**137Q ANTENNAS** — Utilize an easily erected 8 section, 15 foot diameter paraboloid reflector. Choice of tower assemblies provides a reflector center height of 34', 26'5", 18'10" or 11'3". An accessory erection kit facilitates installation. 137Q-1 — antenna only; Q-2 antenna and tower; Q-3 antenna and tower with remote azimuth control. *Frequency Range:* 755-985 mc. *Power Gain:* 29 db over isotropic antenna. *Horn Power Rating:* 15 kw (limited by transmission line). *Wind Loading:* 100 mph.

**35R-1 COAXIAL BRANCHING FILTER** — The 35R-1 consists of two 3¼" coaxial line rejection notch filters joined by a coaxial T-section for isolation of receiver and transmitter on a common antenna. *Frequency Range:* 755 mc-985 mc. *Power Rating:* 10 kw maximum; 2.5 kw with less than 100 mc receiver-transmitter spacing. *Passband Width:* 7.0 mc or greater. *VSWR:* 1.15 maximum. *Passband Insertion Loss:* 0.2 db maximum. *Performance:* Rejection notch not less than 50 db over 7 mc bandwidth. *Terminations:* 50 ohms.

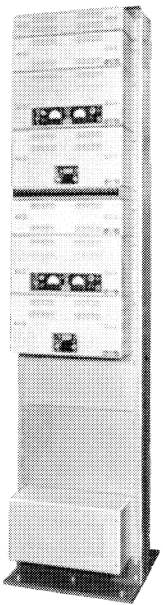
**35Q-1 COAXIAL BANDPASS FILTER** — The four section 35Q-1 will supply additional bandpass filtering between the receiver and branching filter. Connectors for 50 ohm, 1½" rigid coaxial line. An adapter is available for connection to 3¼" line. *Frequency Range:* 755-985 mc. *Power Rating:* 250 watts. *Passband:* 7.0 mc or greater. *VSWR:* 1.15 maximum. *Insertion Loss:* 0.2 db maximum. *Performance:* Rejection not less than 50 db at 60 mc removed from pass frequency.

	Type	Dimensions (inches)			Weight lbs.		Type	Dimensions (inches)			Weight lbs.
		W	D	H				W	D	H	
Power Amplifier Rectifier Cabinet Heat Exchanger	240D-1, -2	116	34	78	8700 (total)	Air Inflatable Antenna tower mounted	537J-1, -2, -3	71 cu. ft.**		600	
		32	20½	78							
		50	25	72							
Power Amplifier	240E-2	75 ¼	34	78	2600	15' Antenna	137Q-1	164 cu. ft.**	552		
Diversity Receiver	651C-1, -2, -3	20½	18	86¾	425	15' Antenna & Tower	137Q-2	230 cu. ft.**	1332		
Exciter-Modulator	310K-2	19	7	80½*	227*	15' Antenna Tower & Control	137Q-3	225 cu. ft.**	1402		
Exciter-Modulator	310K-3	19	7	68¾*	202*	Erection Kit			190		
Air Inflatable Antenna roof mounted	537J-1, -2, -3	60 cu. ft.**			400	Coaxial Branching Filter	35R-1	65	73	5	160
						Coaxial Bandpass Filter	35Q-1	39½	6½	6	26

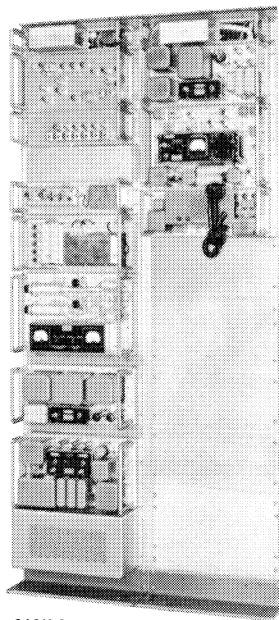
\*Excluding rack. \*\*Storage volume.



240D-1



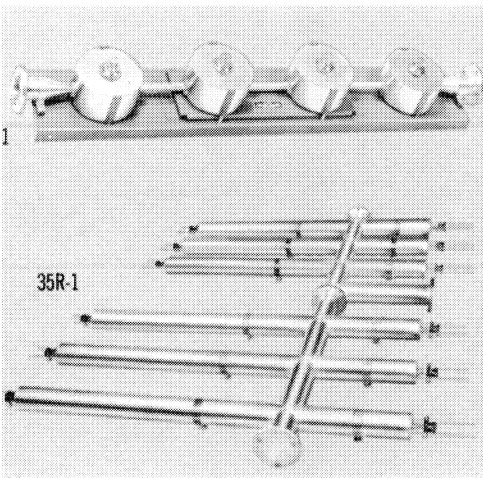
651C-1



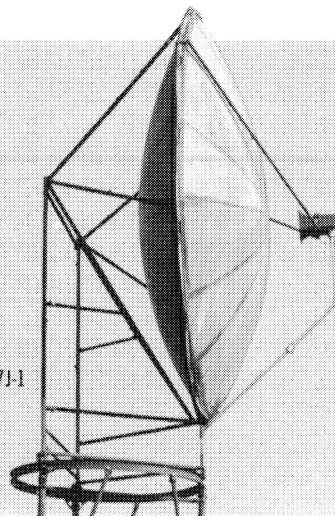
310K-2



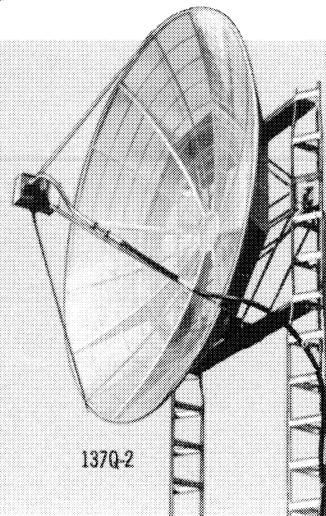
240E-2



35R-1



537J-1



137Q-2

# 2,000 MC SYSTEMS

Recent developments resulting from Collins Transhorizon research include a complete line of equipment for the 1700-2400 mc frequency range. This equipment is equally applicable to Transhorizon or line-of-sight communication systems. Unit type construction permits maximum system flexibility. High-density voice carrier operation or high definition TV transmission may be utilized.

**310T-2A FM EXCITER** — Provides a crystal controlled, phase-modulated signal in the 1700-2400 mc frequency range. The minimum 500 milliwatt power output is adjustable over a range that allows optimizing the driving level when a power amplifier is used. The exciter consists of two rack mounted units: T310-1 Modulator-Multiplier having a 70 mc modulated signal output and T310-2 UHF converter-amplifier which heterodynes the 70 mc signal to the 1700-2400 mc band. Up to 132 frequency division multiplexed 4 kc channels plus order wire can be transmitted by the 310T-2A. Integral metering circuits are provided, and units are mounted on articulated hinges giving complete rear accessibility to facilitate maintenance. Each unit is equipped with self-contained power supplies, and provision is made for air cooling all heat dissipating components. *Peak Frequency Deviation: ±672 kc. Incidental FM Noise Level: 19 dba maximum. Intermodulation Distortion Level: 19 dba maximum. Multiplex Frequency Response: ±0.5 db, 4-552 kc. Order Wire Frequency Response: +1.0, -2.0 db, 300 cps to 12 kc. Operating Ambient Temperature: -40° C. to +55°C. Line Voltage: 105-125 v, 47-420 cps, 1 phase, 2 amps.*

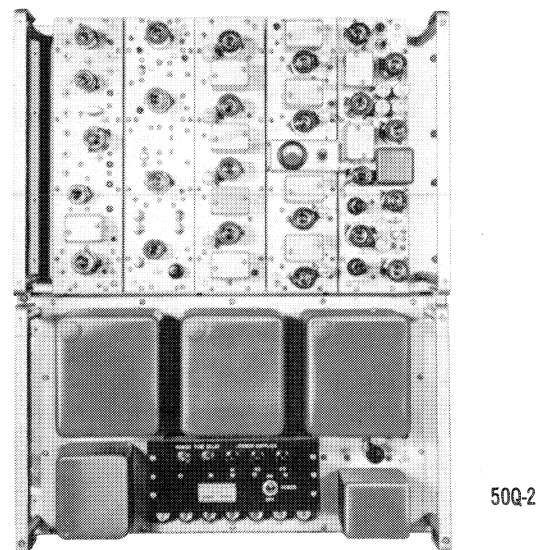
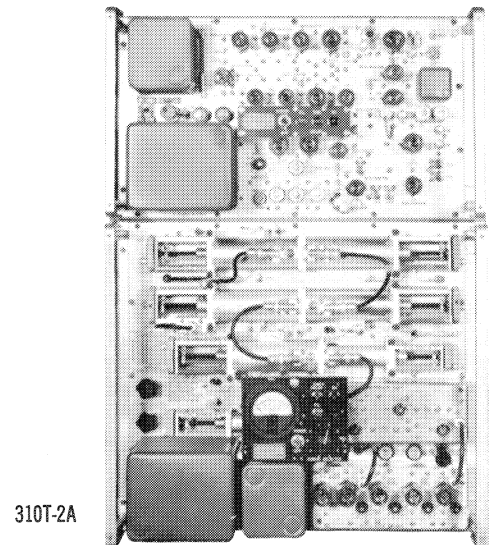
**50Q-2 FM RECEIVER** — A crystal controlled, double conversion FM receiver for operation in the 1700 to 2400 mc frequency range. The 50Q-2 uses a Collins developed technique called Automatic Bandwidth Control for significantly reducing the threshold signal level while maintaining the advantages of a conventional FM receiver. IF modules may be selected for operation with up to 132 frequency division multiplexed 4 kc channels. Several receivers may be operated in diversity by simple parallel connection. Integral metering circuits are included. All heat dissipating components are air cooled. *Noise Figure: 8 db. Automatic Bandwidth Control Range: 7 db. Incidental FM Noise Level: 19 dba maximum. Multiplex Frequency Response: ±0.5 db, 4-552 kc. Order Wire Frequency Response: ±1.0 db, 300-3500 cps. Operating Ambient Temperature: -40°C to +55°C. Line Voltage: 105-125 v, 47-420 cps, 1 phase, 4.5 amps.*

**240F-2 POWER AMPLIFIER** — has a nominal 1 kw CW output over the 1700 to 2400 mc range. A Varian VA-802, four cavity aircooled klystron with permanent magnet focusing, provides a 50 db gain with a bandwidth of 3.0 mc when synchronously tuned and a 40 db gain with a bandwidth of 5.5 mc when stagger tuned for a maximum efficiency. The Collins 310T2-A is normally used to supply excitation requirements. Front panel metering of major functions facilitate adjustment and operation. All operating controls, with the exception of output coupling, are located on a front control panel. Protective circuits remove all klystron voltages in the event of cooling air failure or power supply malfunction. Body and beam current overload protection is also provided.

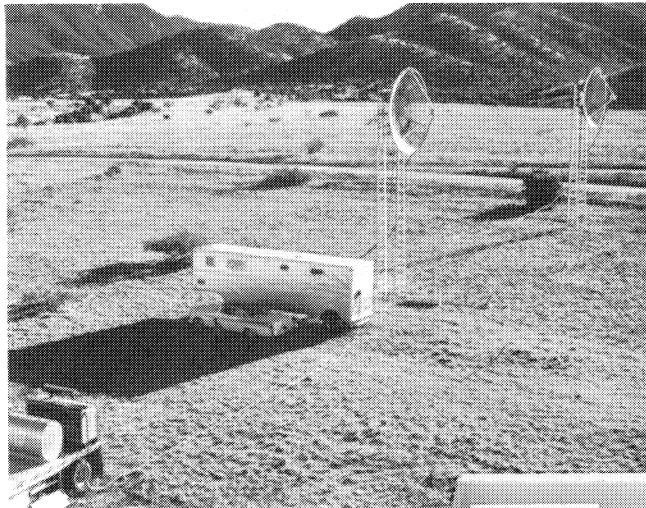
Calibrated directional couplers are included on both RF input and output lines. Frequency of operation may be easily changed by returning the four cavities for maximum power output. *Driving Power: 100 mw max. Freq. Stability: .001% when driven by 310T-2A Exciter. Beam Efficiency: 30% min. Cooling: Forced air. Temp. Range: -18°C to +45°C. Primary Power: 208 v, ±10%, 400 cps, 4 wire, 5 kva with 1 kw output.*

	Type	Dimensions (inches)			Weight (lbs.)
		W	D	H	
FM Exciter	310T-2A	19	7	26¼*	68.5
FM Receiver	50Q-2	19	7	46½*	133.0

\*Excluding rack.

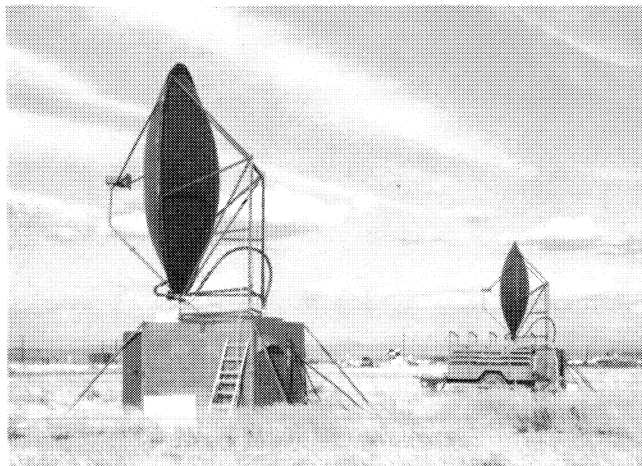
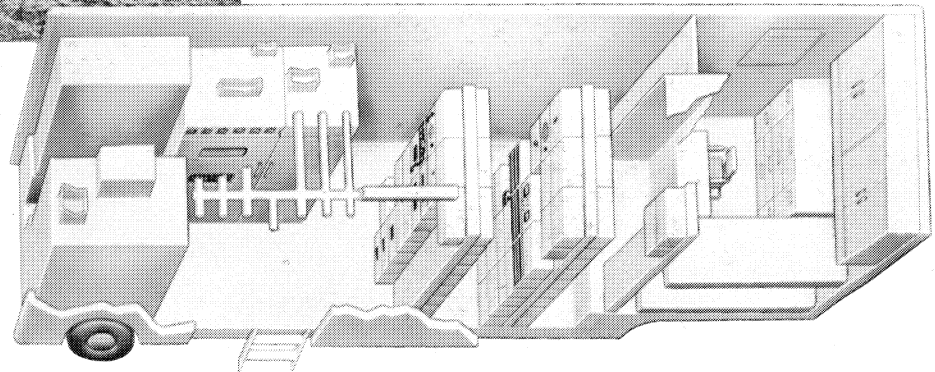


# TRANSPORTABLE SYSTEMS

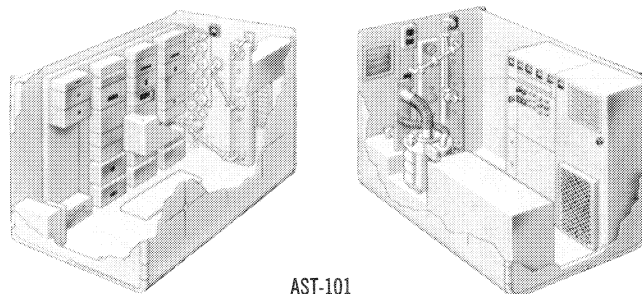


**GROUND TRANSPORTABLE TST-101-201** — The TST-101 Transhorizon Terminal, capable of 1 kw transmission and dual diversity reception in the 755-985 mc range, is transported by two semi-trailers. A flat-bed trailer carries two disassembled antennas, generator and fuel tank. Equipment includes 240E-2 Power Amplifier, 310K-3 Exciter-Modulator, 50G UHF Receivers, Multiplex, 137Q-3 Antennas, Diplexers and HF units. The TST-201 provides 10 kw power output and consists of the van with 240D-1 Power Amplifier replacing the 240E-2. Antenna and power facilities are additional for TST-201. *Size:* Van — 8' W, 31' L, 11'3" H. Flat-bed — 8' W, 24' L, 12½' H (loaded). *Primary Power:* TST-101 — Generator supplied. TST-201 — 208 v ±10%, 3 phase, 4 wire, 60 +10 or -3 cps; 62.5 kw max. power. 208 v, single phase, 60 cps, reg. at 1.5 kva. *Loaded Weight:* TST-101 — Van, 23,000 lbs.; flat-bed, 17,240 lbs. TST-201 — Van, 30,000 lbs.

TST-101



**AIR TRANSPORTABLE AST-101** — This complete 1 kw Transhorizon terminal consists of two shelters that can be transported by cargo aircraft or truck. Air inflatable parabolic antennas can be stored in the shelters during transit. One shelter contains the 310K-3 Exciter, 50G UHF Receivers, and Diplexers. Multiplex equipment not normally supplied, but available on special order. The second shelter houses a re-packaged 240E-2 Power Amplifier. *Size:* Each shelter — 82⅝" W, 103" L and 83⅞" H. *Primary Power:* 230 v, single phase, 60 cps, grounded neutral; load balance within 5 amps on either leg; 9,236 watts maximum (less heaters). *Weight:* Rec.-Ex. — 3100 lbs.; PA — 3320 lbs.



AST-101

**AIR TRANSPORTABLE AST-102** — A versatile 1 kw Transhorizon terminal employing diversity reception in the 1700-2400 mc frequency range. It is completely self-contained in a single light weight shelter that can be transported by cargo aircraft, helicopter or truck. The air inflated parabolic antennas have a 360° rotational range for siting and be stored in the shelter during transit. A bi-polarized feed horn is employed. One antenna is roof mounted and the other is located on a tower, with the receiver RF unit an integral part of each antenna. Equipment contained in the shelter includes a 50Q-2 FM Receiver, which utilizes Automatic Bandwidth Control for improved threshold level, 310T-2A FM Exciter, a 1 kw klystron RF amplifier and provision for AN/TCC-3 or AN/TCC-7 Multiplex. If desired, the exciter output may be connected directly to the antenna for line-of-sight applications. *Size:* 82⅝" W, 103" L, 83⅞" H. *Weight:* 4,000 lbs.