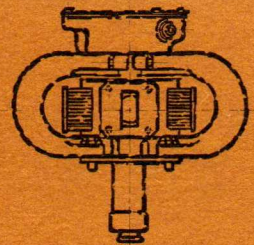


Litton Electron Tube Product Summary

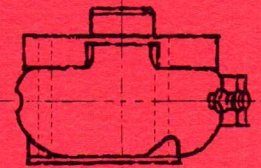
Traveling Wave Tubes



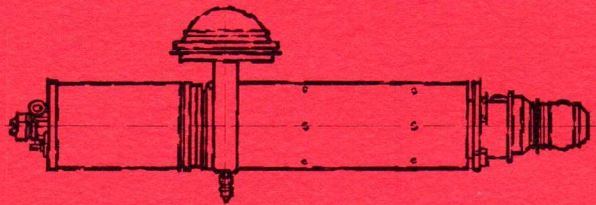
Magnetrons



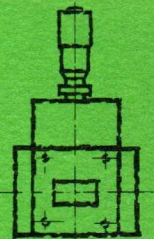
M-Type Backward Wave Oscillators



Klystrons/Switch Tubes

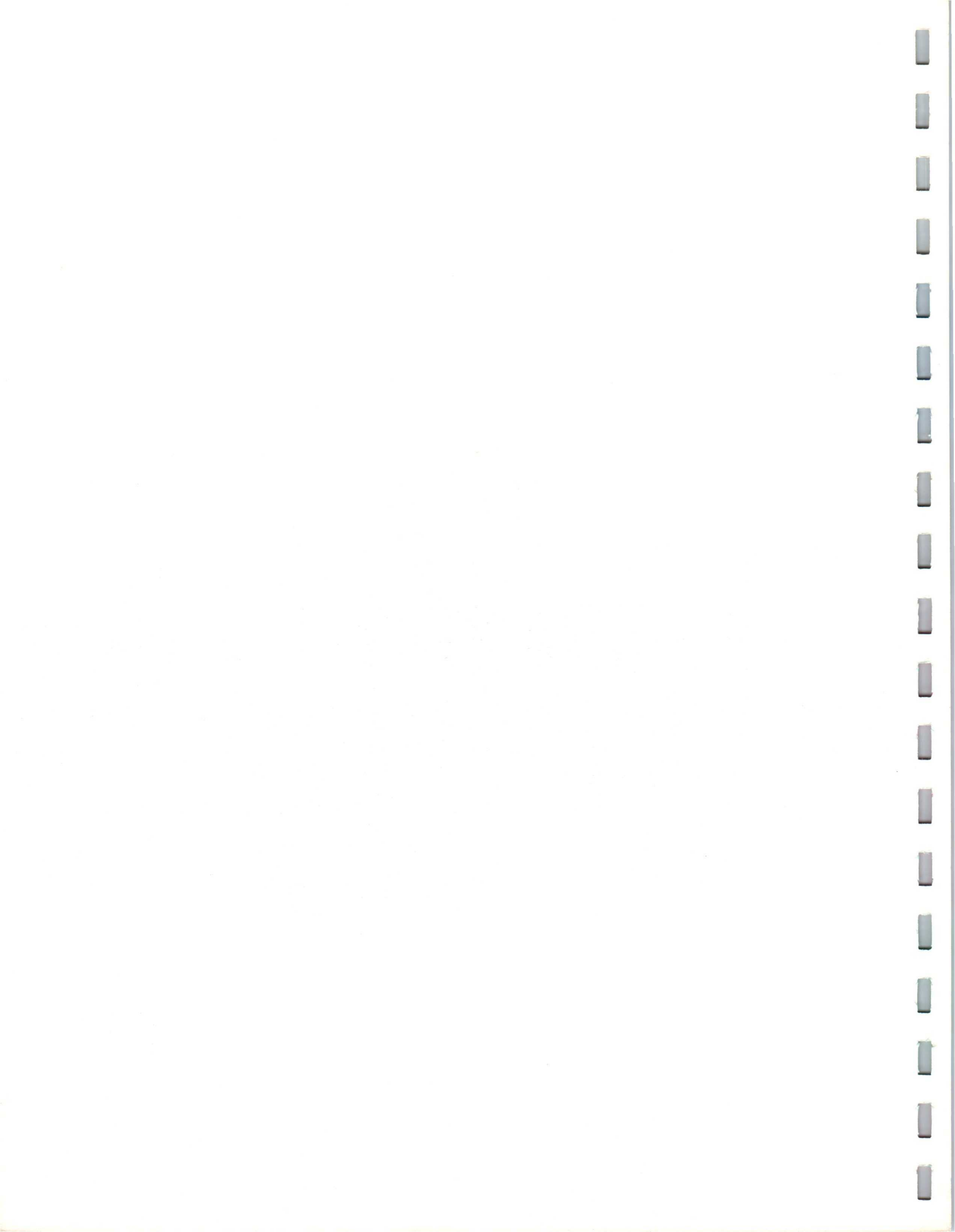


Solid-State Devices

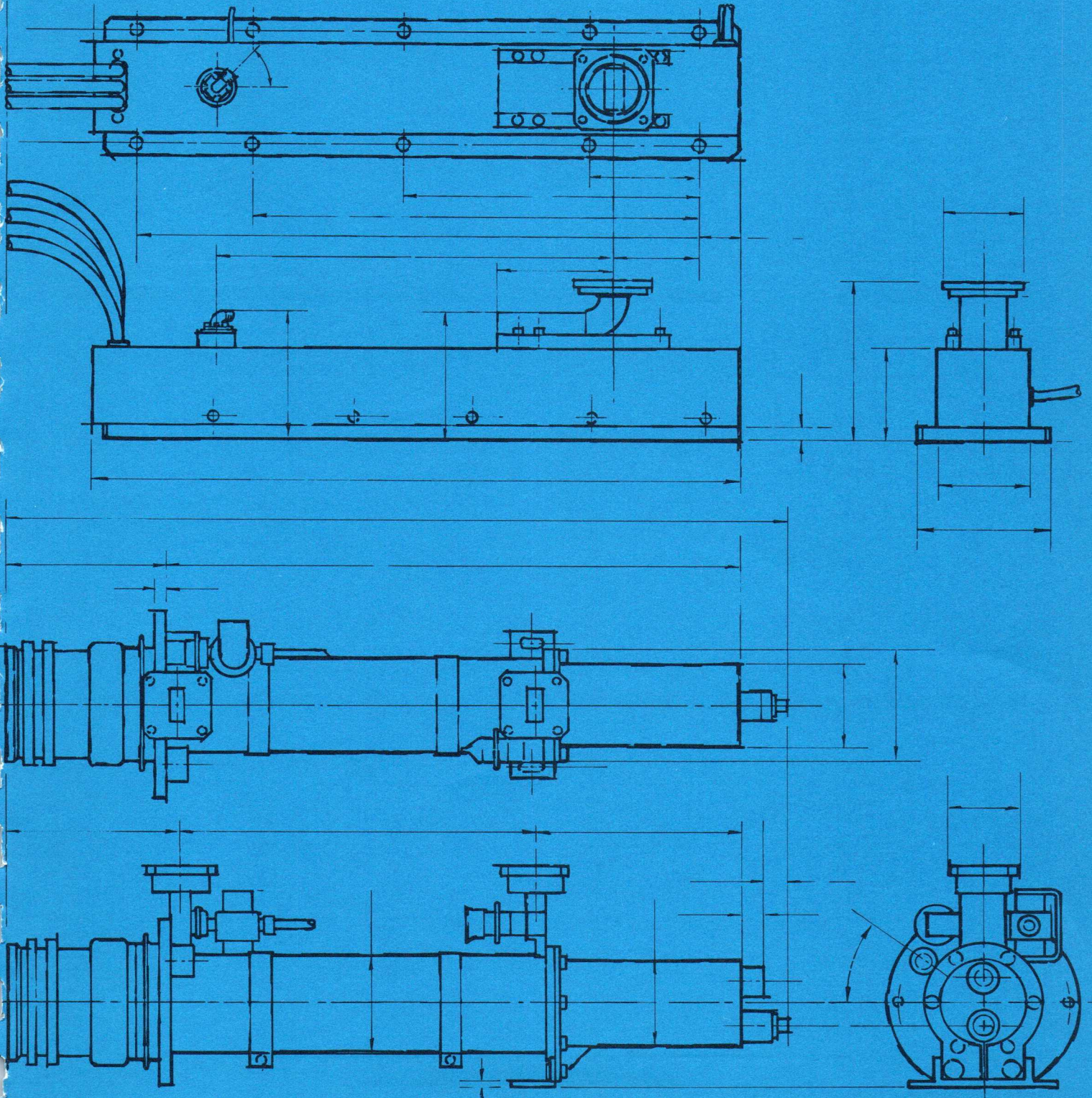


Cathode Ray Tubes





Litton Traveling Wave Tube Product Summary

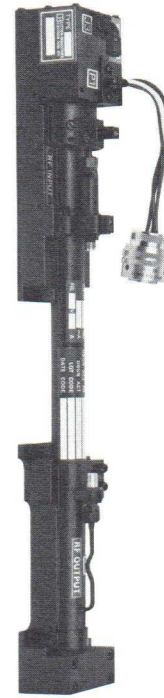




L-2337 12.2" Long



L-2364 13.5" Long



L-2385 14.0" Long

LOW NOISE, LOW POWER TWT's

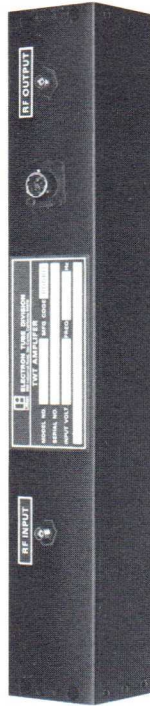
Tube Type	Frequency Range (GHz)	Power Output (mW)	Small Signal Gain (dB)	Noise Figure (dB)	Applications/Comments
L-2333-08	2.0-4.0	10	35	20	These PPM focused TWT's are qualified for military ECM receivers and pre-drivers. They provide extremely flat gain response versus frequency.
L-2369-01	2.6-5.2	40	40	15	
L-2369-00	2.6-5.2	100	30	13	
L-2357-08	4.0-8.0	10	30	13	
L-2377-01	4.0-8.0	10	35	20	
L-2357-04	4.8-9.6	30	33	13	
L-2371	4.8-9.6	300	38	17	
L-2337-18	7.0-12.4	20	37	12	
L-2375-00	8.0-16.0	20	35	12	
L-2365-04	8.0-18.0	10	30	15	
L-2373	8.0-18.0	100	40	17	
L-2376-02	12.4-18.0	10	40	10	

LOW NOISE, MEDIUM POWER TWT's

Tube Type	Frequency Range (GHz)	Power Output (W)	Small Signal Gain (dB)	Noise Figure (dB)	Applications/Comments
L-2342-03	1.0-2.0	1	30	21	The PPM focused TWT's in this family are designed for ECM or radar drivers where low noise power is required. All of these tubes are qualified for airborne environments.
L-2330-00	2.0-4.0	1	35	13	
L-2370-00	2.6-5.2	1	35	16	
L-2352	2.6-5.2	1	46	17	
L-2335-17	4.0-8.0	1	35	17	
L-2372-00	4.8-9.6	1	37	18	
L-2366-00	7.0-11.0	1	35	18	
L-2338-19	7.0-11.0	3	40	20	
L-2338-13	7.0-12.4	1	45	18	
L-2364-02	8.0-16.0	1	35	20	
L-2374	8.0-18.0	1	40	22	
L-2389	8.0-18.0	0.5	30	22	



M-2823 12.5" Long



M-2797 12.5" Long



M-2796 14.0" Long

LOW NOISE TWT AMPLIFIERS

Amplifier Type	TWT Type	Frequency Range (GHz)	Power Output (mW)	Small Signal Gain (dB)	Noise Figure (dB)	Input Power	Applications/Comments
M-2786	L-2369	2.6-5.2	40	40	15	115V, 1 ϕ , 57-420 Hz	
M-2791	L-2369	2.6-5.2	100	30	13	115V, 1 ϕ , 57-420 Hz	
M-2781	L-2357	4.0-8.0	10	30	13	115V, 1 ϕ , 57-420 Hz	
M-2781	L-2357	4.8-9.6	30	33	13	115V, 1 ϕ , 57-420 Hz	
M-2793	L-2337	7.0-12.4	20	37	12	115V, 1 ϕ , 57-420 Hz	
M-2793	L-2363	7.0-12.4	30	50	15	115V, 1 ϕ , 57-420 Hz	
M-2798	L-2375	8.0-16.0	10	35	12	115V, 1 ϕ , 57-420 Hz	
M-2797	L-2376	10.7-18.0	16	37	12	115V, 1 ϕ , 57-420 Hz	
M-2797	L-2376	12.4-18.0	10	40	10	115V, 1 ϕ , 57-420 Hz	
M-2797	L-2365	8.0-18.0	10	30	15	115V, 1 ϕ , 57-420 Hz	
M-2821	L-2396	4.0-8.0	300	30	14	115V, 1 ϕ , 400 Hz	
M-2822	L-2397	8.0-12.0	400	30	15	115V, 1 ϕ , 400 Hz	
M-2823	L-2398	12.0-18.0	500	30	20	115V, 1 ϕ , 400 Hz	
M-2823	L-2389	8.0-18.0	500	30	22	115V, 1 ϕ , 400 Hz	
M-2816	L-2330	2.0-4.0	1000	35	13	115V, 3 ϕ , 400 Hz	
M-2816	L-2370	2.6-5.2	1000	35	16	115V, 3 ϕ , 400 Hz	
M-2788	L-2335	4.0-8.0	1000	30	17	115V, 3 ϕ , 400 Hz	
M-2788	L-2372	4.8-9.6	1000	38	17	115V, 3 ϕ , 400 Hz	
M-2795	L-2366	7.0-11.0	1000	40	18	115V, 3 ϕ , 400 Hz	
M-2785	L-2338	7.0-11.0	3000	40	20	115V, 3 ϕ , 400 Hz	
M-2785	L-2338	7.0-12.4	1000	45	18	115V, 3 ϕ , 400 Hz	
M-2796	L-2364	8.0-16.0	1000	35	20	115V, 3 ϕ , 400 Hz	
M-2796	L-2374	8.0-18.0	1000	40	22	115V, 3 ϕ , 400 Hz	

These low and medium power TWT amplifiers feature solid-state power supplies and are ruggedized for use in military environments. They are designed to withstand temperature extremes with conduction cooling. Blanking and serrodyne options are generally available. These units are used as drivers or receivers in ECM and radar applications.



L-2388 12.5" Long



L-5559 12.25" Long



L-5008 9.35" Long

MEDIUM POWER TWT's — CW

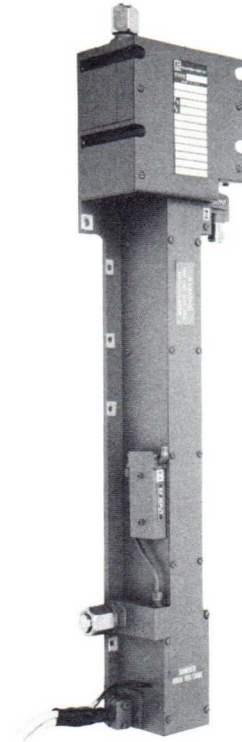
Tube Type	Frequency Range (GHz)	Power Output (W)	Small Signal Gain (dB)	Weight (lbs.)	Remarks	Applications/Comments
L-2342-05	1.0-2.0	1	30	3.0		
L-5573	1.0-2.0	10	30	3.0	Mod Anode	
L-5560	1.0-2.0	20	35	3.0	Mod Anode	
L-2379-00	2.0-4.0	1	30	3.0		
L-5007	2.0-4.0	2	36	1.5		
L-3971-50	2.0-4.0	2	50	1.5		
L-2332	2.0-4.0	3	37	5.0		
L-5574	2.0-4.0	10	35	3.0	Mod Anode	
L-5561	2.0-4.0	20	35	3.0	Mod Anode	
L-2380-00	2.6-5.2	1	30	3.0		In addition to usage in conventional instrumentation amplifiers, these TWT's find particular application in ECM, radar and target augmentation systems.
L-2387-00	2.6-5.2	2	42	2.0		
L-2381-00	4.0-8.0	1	30	3.0		
L-5137-50	4.0-8.0	2	33	1.5		
L-2385	4.8-9.6	2	50	2.0		
L-5009	4.0-8.0	2	50	1.5		
L-5575	4.0-8.0	10	35	2.5	Mod Anode	
L-5559	4.0-8.0	20	35	2.5	Mod Anode	
L-2382-00	5.0-10.0	1	30	3.0		
L-3972-50	5.4-10.7	1	60	1.5		
L-3957	5.4-10.7	2	60	1.5		
L-5380-01	7.9-8.4	15	48	3.5	WG Output	



L-5227 12.0" Long



L-2082-50 21" Long



L-2098-50 23" Long

MEDIUM POWER TWT's – CW (cont'd)

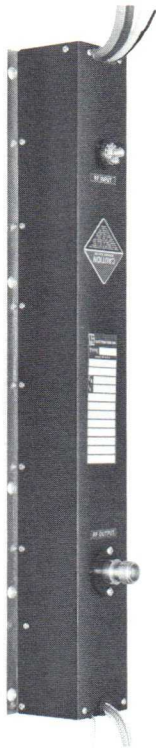
Type Type	Frequency Range (GHz)	Power Output (W)	Small Signal Gain (dB)	Weight (lbs.)	Remarks	Applications/Comments
L-2383-00	7.0-12.4	1	30	3.0		
L-5008	8.0-12.0	2	36	2.5		
L-5576	8.0-12.4	10	35	2.5	Mod Anode	
L-5558	8.0-12.4	20	35	2.5	Mod Anode	
L-5396-01	7.0-18.0	1	30	2.5		
L-2384	8.0-16.0	1	35	3.0		
L-2384-02	8.0-18.0	1	35	3.0		
L-2388	8.5-17.0	1	45	2.0		
L-5577	8.0-16.0	10	35	2.5	Mod Anode	
L-5227	12.4-18.0	2	35	2.5	WG Output	
L-5557	12.4-18.0	10	35	2.5	Mod Anode	

In addition to usage in conventional instrumentation amplifiers, these TWT's find particular application in ECM, radar and target augmentation systems.

HIGH POWER TWT's – CW

Tube Type	Frequency Range (GHz)	Power Output (W)	Small Signal Gain (dB)	Weight (lbs.)	Cooling	Applications/Comments
L-2009	0.5-1.0	300	26	40	Forced Air Solenoid	
L-2055	1.0-2.5	1500	30	32	Liquid Solenoid	
L-2086-50	1.8-3.6	500	30	10	Conduction	
L-2098-50	2.0-4.0	1000	33	16	Liquid	
L-2082-50	2.7-5.4	450	36	12	Conduction	
L-2089-50	2.7-5.4	300 WCW 600 WP	33 39	8.5	Conduction	
L-5324	4.8-9.6	200	40	7	Conduction	
L-5678	7.6-18.0	125	47	8	Conduction	

These tubes, distinguished by their wide bandwidths and high gain, are built for rugged environments such as MIL-E-5400, Class 2 airborne. Applications include ECM and communications.



L-5679-51 19.5" Long



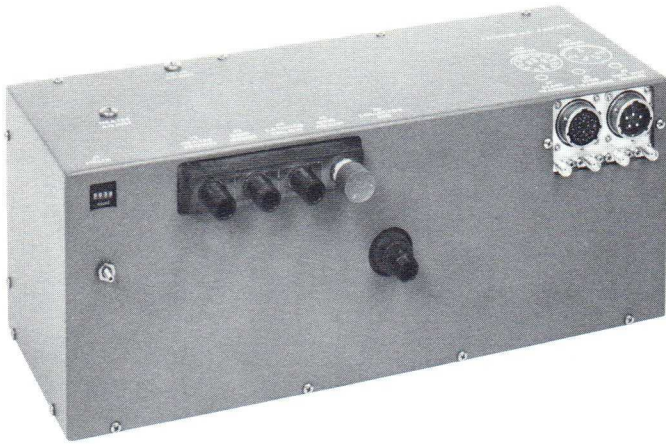
L-5336 16.6" Long



L-5581 13.1" Long

HELIX TWT's — PULSED

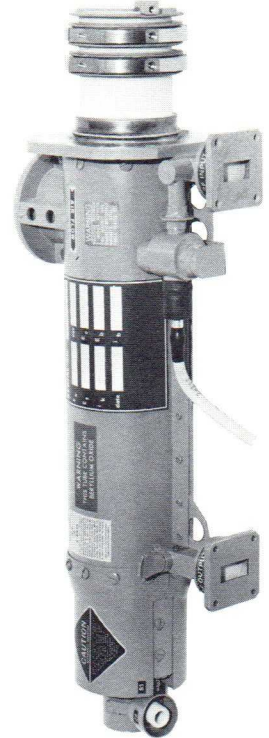
Tube Type	Frequency Range (GHz)	Power Output (kW)	Gain at Rated Power (dB)	Maximum Duty Cycle	Applications/Comments
L-5585-50	.7-2.0	1	30	.02	Helix pulsed traveling wave tubes are available at 1 kilowatt minimum peak power output in frequency ranges from 0.7 to 18.0 GHz. These TWT's feature wide bandwidths in addition to small size and light weight.
L-5568-50	1.0-2.0	1	35	.02	
L-5336-50	2.0-4.0	1	35	.02	
L-5283-50	2.0-4.0	1	50	.02	
L-5321-50	2.65-5.3	1	35	.02	
L-5320-50	2.65-5.3	1	50	.02	
L-5624-50	4.0-8.0	1	35	.02	
L-5579-50	4.0-8.0	1	55	.02	
L-5489-50	5.0-10.0	1	50	.04	
L-5555-50	6.0-10.0	1	60	.02	
L-5089-50	7.0-11.0	1	35	.02	
L-5126-50	7.0-11.0	1	60	.02	
L-5555-51	7.0-12.0	1	60	.02	
L-5089-54	8.0-12.0	1	40	.02	
L-5546-50	8.0-12.0	1	30	.05	
L-5444-50	8.0-16.0	1	55	.04	
L-5495-50	8.5-18.0	1	50	.04	



M-663 13" Long



L-5391-57 18" Long



L-5519-55 18" Long

RING-LOOP TWT's — PULSED

Tube Type	Frequency Range (GHz)	Power Output (kW)	Gain at Rated Power (dB)	Maximum Duty Cycle	Applications/Comments
L-5476-50	1.25-1.35	5	30	.04	Utilizing the ring-loop type of interaction circuit, this family of traveling wave tubes offers high peak power and high efficiency in exceptionally small, lightweight packages. Flexibility in bandwidth selection is also available.
L-5570-50	1.2-1.4	7	50	.04	
L-5620-50	1.8-1.9	2	35	.10	
L-5540-50	1.8-2.1	2	35	.10	
L-5584-00	2.4-2.6	3	30	.04	
L-5478-00	2.9-3.1	3	40	.01	
L-5569-50	2.8-3.2	3	60	.02	
L-5551-50	3.1-3.5	3	36	.02	
L-5366-50	3.0-3.5	3	60	.04	
L-5562-50	2.6-3.4	5	40	.025	
L-5565-50	3.1-3.5	11	40	.015	
L-5679-51	3.2-3.7	10	47	.02	
L-5563-50	9.5-9.9	2	55	.02	
L-5571-50	9.5-10.0	4	60	.04	
L-5591-50	8.9-9.5	6	65	.02	
L-5581-50	9.6-9.9	8	55	.02	
L-5563-51	10.8-11.8	2	63	.02	
L-5588-50	9.0-10.5	2	60	.05	
L-5542-50	8.0-10.5	5	40	.01	
L-5586-50	9.8-10.1	5	55	.04	
L-5411-50	16.5-17.5	1	60	.01	
L-5412-50	16.0-17.0	1	30	.02	

TWT POWER SUPPLIES

Power Supply Type	Pulsed or CW TWT's	Size (inches)	Weight (lbs.)	Environment	Input Power	TWT Power Range	Applications/Comments
M-624	Pulsed	7x19x18	60	Laboratory	115V, 1 ϕ , 60 Hz	1-10 kW	These solid-state power supplies are custom designed to operate with most of the TWT's manufactured by Litton. Laboratory and military requirements are met as required. Where pulsed applications are needed, the power supply includes a built-in modulator.
M-663	Pulsed	4.9x5.1x13	23	Airborne	115V, 3 ϕ , 400 Hz	1-10 kW	

COUPLED CAVITY TWT's — PULSED

Tube Type	Frequency Range (GHz)	Minimum Power Output (kW)	Minimum Small Signal Gain (dB)	Maximum Duty	Cooling	Applications/Comments
L-5512-50	2.9-3.1	120	50	0.05	Liquid Cooled; gridded	Special attention in the design of these tubes has resulted in size and weight reductions through improved fabrication, focusing and cooling techniques. These tubes are particularly suited for lightweight transportable and airborne radar, and communications equipment.
L-5519-55	9.5-10.0	15	56	0.015	Forced Air; gridded	
L-5391-57	9.0-9.6	120	44	0.004	Forced Air; gridded	
L-5514-50	9.3-9.9	50	56	0.015	Liquid Cooled; gridded	
L-5519-51	9.5-10.0	15	57	0.0125	Liquid; gridded	
L-5253	9.4-10.1	40	46	0.002	Conduction	

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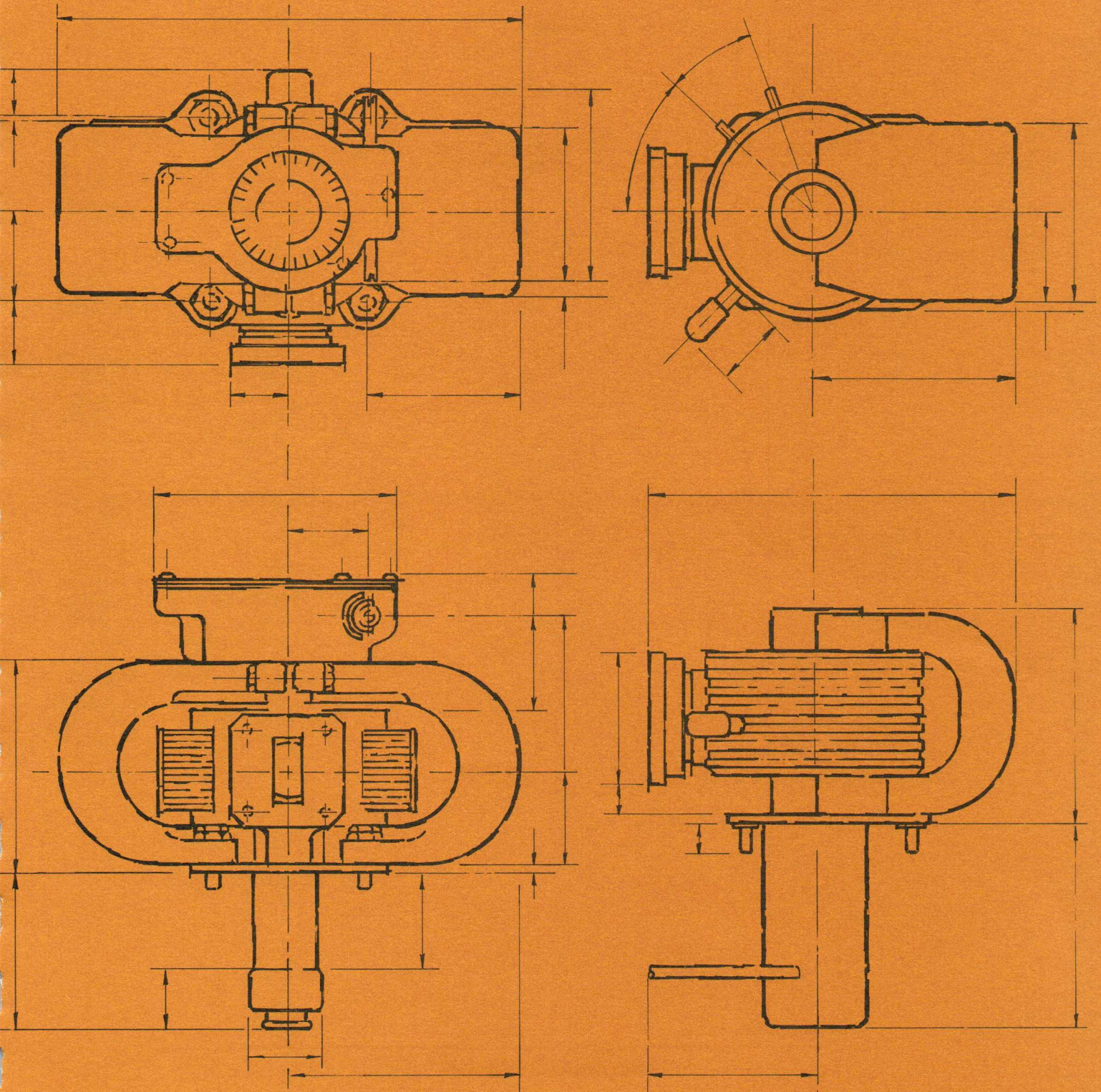
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182 Ben Yehuda Street
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03-236334

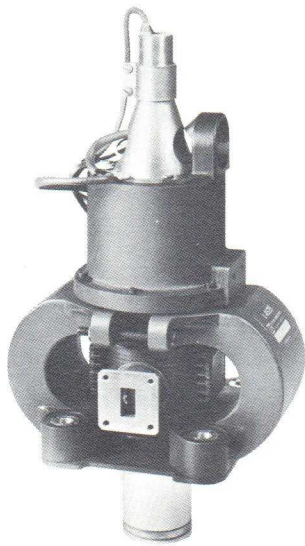


ELECTRON TUBE DIVISION

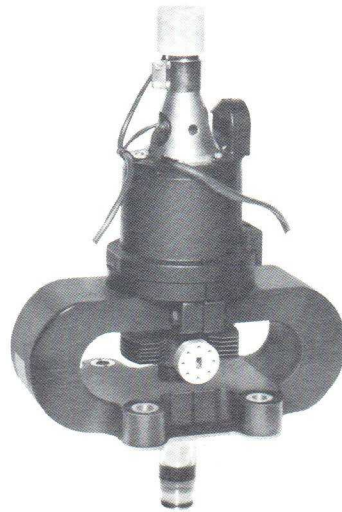
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Litton Magnetron Product Summary

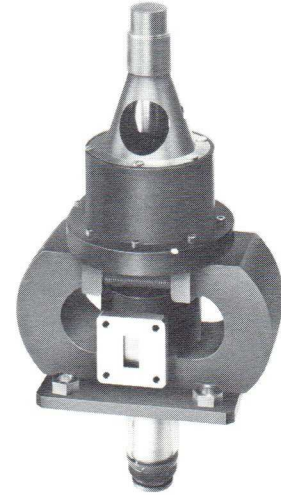




L-4525 11.4" High



L-4558 11 1/4" High



L-4527 10 1/16" High

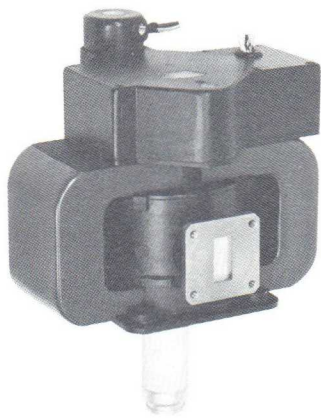
Rapid Tuned Pulse Magnetrons

J-BAND COAXIAL — ELECTROMAGNETICALLY TUNED

Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-4525	90	16,000-16,500	Electromagnetic	12.6	2.5	15-17	18.0	.001	12.5	Tunable over 500 MHz of J-band at rates up to 100 Hz. The electro-magnetic tuner and velocity feedback transducers (LVDT and LVT) provide high-speed random tuning capability with outstanding output frequency monitoring accuracy under all environmental conditions.
L-4527	65	16,200-16,800	Electromagnetic	12.6	2.4	13-15	14.0	.0015	7.0	

K-BAND COAXIAL — ELECTROMAGNETICALLY TUNED

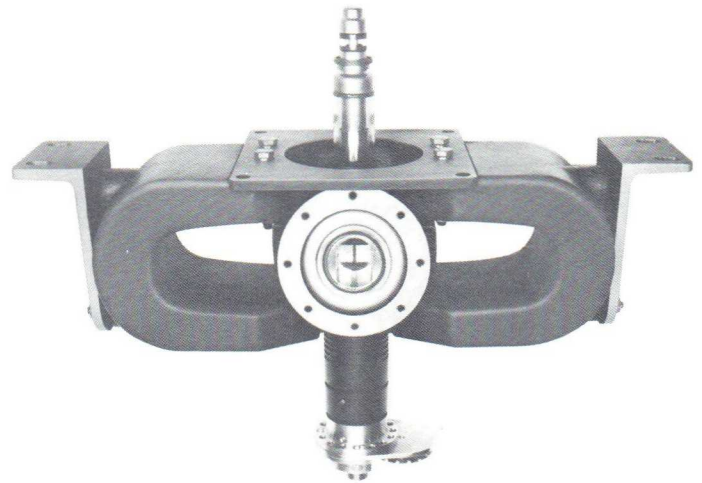
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-4558	65.0	32,100-33,100	Electromagnetic	6.3	3.5	16.0	16.0	.001	15.0	Tunable over 1000 MHz of K-band at rates up to 400 Hz. Designed for wideband, high speed frequency diversity radar systems. The electro-magnetic tuner and velocity feedback transducers (LVDT and LVT) provide high-speed random tuning capability with outstanding output frequency monitoring accuracy under all environmental conditions.



L-5224 7⁹/₁₆" High



L-4649 4.975" High



L-5080 12⁵/₈" High

Gyro-Tuned™ Pulse Magnetrons

I-BAND COAXIAL – TUNABLE

Tube Type	Min. Peak Power (kw)	Frequency (MHz)	F/A Rate (Hz)	F/A Range (MHz)	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
					Ef Volts	If Amps	eb kilovolts	ib amps			
L-5224	75.0	9100-9500	75	60-85	12.6	2.0	15.0	15.0	.0011	12.5	
L-5224A	85.0	9000-9500	75	60-95	12.6	2.0	15.0	15.0	.0011	12.5	

I-BAND COAXIAL – FIXED FREQUENCY

Tube Type	Min. Peak Power (kw)	Frequency (MHz)	F/A Rate (Hz)	F/A Range (MHz)	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)
					Ef Volts	If Amps	eb kilovolts	ib amps		
L-4648	100.0	9375±15	75	70	12.6	2.5	15.5	16.0	.0012	10.5

J-BAND COAXIAL – FIXED FREQUENCY

Tube Type	Min. Peak Power (kw)	Frequency (MHz)	F/A Rate (Hz)	F/A Range (MHz)	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)
					Ef Volts	If Amps	eb kilovolts	ib amps		
L-4649	35.0	16,780-16,820	200	225-275	15.0	0.82	13.5	9.5	.0006	5.0

These lightweight, reliable, metal-ceramic coaxial magnetrons feature gyro-tuning to provide frequency agility for airborne search, navigation, terrain following and missile seeker radar applications.

Gyro-tuning employs a ring gear which drives a set of rotating dielectric paddles within the magnetron coaxial cavity. A high speed, synchronous motor drives the entire mechanism, which is external to the tube vacuum envelope. The complete tuner assembly is compact and adds only 1/2 pound to the basic magnetron weight.

Pulse Magnetrons

G-BAND VANE & STRAP

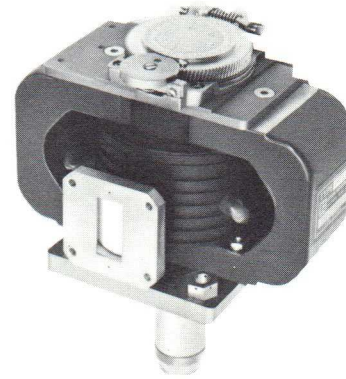
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-3897	175	4950-5450	Mechanical	13.5	2.5	21.5	22.0	.001	25	Operational and field life is in excess of 1000 rf hours. Applications include shipboard and airborne search and weather radar as well as surveillance systems.
6344A	175	5450-5825	Mechanical	13.5	2.5	21.5	22.0	.001	25	
7156A	250	5450-5825	Mechanical	5.0	5.0	25.0	24.0	.001	35	
7460	250	5450-5825	Mechanical	5.0	5.0	25.0	25.0	.0012	35	
L-5080	250	5450-5825	Mechanical	5.0	5.0	25.0	25.0	.0012	35	



L-5047 6½" High



L-3990 4¾" High



L-5273 6¾" High

Pulse Magnetrons

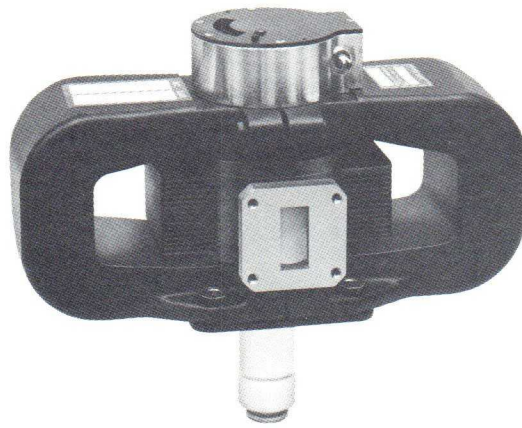
I-BAND COAXIAL

Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-4553	65	9375±30	Fixed	12.6	2.2	15.0	15.0	.001	6.0	Direct replacement for type 4J52A.
L-4571/ 8947	65	8500-9600	Mechanical	12.6	2.2	15.0	15.0	.001	7.0	Direct replacement for type 6543.
L-4469/ 8855	200	8500-9600	Mechanical	13.75	3.1	21.5	27.5	.0011	13.0	Direct replacement for type 7111.
L-4575	200	8500-9600	Mechanical	13.75	3.1	21.5	27.5	.0011	13.5	Direct replacement for type 7008.
L-4583A	200	9200-9550	Mechanical	13.75	3.1	21.5	27.5	.0011	13.5	Direct replacement for type L-4193B.
L-4590/ 8945	200	8700-9400	Mechanical	13.75	3.1	21.5	27.5	.0013	13.0	Direct replacement for type L-4502.
L-3990	24	9375±30	Fixed	6.3	1.2	8.0	8.25	.0022	4.5	Coaxial design extends operating life for commercial weather radar applications; provides 50% efficiency, low cathode loading, excellent spectrum, and operation up to 6 microseconds.
L-5196	24	9375±30	Fixed	6.3	1.2	8.0	8.25	.0015	4.5	
L-5211	24	9375±30	Fixed	6.3	1.2	8.0	8.25	.0015	4.5	
L-5365	28	9345±30	Fixed	12.6	1.15	8.5	8.5	.0015	4.5	
L-5047	65	9375±30	Fixed	14.0	1.4	13.0	12.0	.001	7.5	
L-5536*	65	9375±5	Fixed	14.0	1.4	13.0	12.0	.001	7.5	
L-5191	65	9345±30	Fixed	14.0	1.4	13.0	12.0	.001	7.5	
L-5543	45	9375±20	Fixed	14.0	1.5	13.0	8.0	.0012	7.5	Recommended for new radar systems.
L-5448A	50	9485±15	Fixed	6.3	2.9	15.0	13.0	.001	10.0	
L-5448B	50	9495±15	Fixed	6.3	2.9	15.0	13.0	.001	10.0	
L-5448C	50	9425±15	Fixed	6.3	2.9	15.0	13.0	.001	10.0	
L-5448D	50	9435±15	Fixed	6.3	2.9	15.0	13.0	.001	10.0	
L-5273	95	8500-9600	Mechanical	12.6	3.1	16.0	15.0	.0011	10.0	
L-5462	95	8500-9600	Mechanical	12.6	3.1	16.0	15.0	.0011	10.0	
L-4593	350	8500-9600	Mechanical	13.75	3.2	28.0	30.0	.0011	18.0	
L-4666	350	9150-9350	Mechanical	13.75	3.0	26.5	30.0	.001	14.5	

*Temperature Compensated



L-2J42H 5¼" High



L-4L593 7.8" High



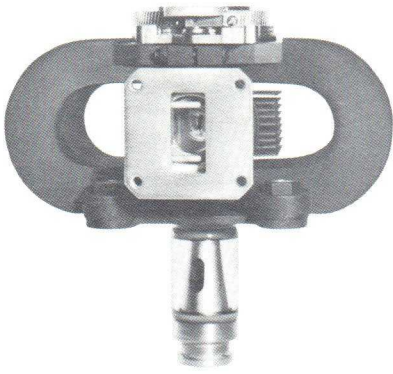
L-4L575 8⅛" High

Pulse Magnetrons

I-BAND VANE & STRAP

Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-4497	4	9375±30	Fixed	6.3	0.6	5.2	3.0	.001	2¼	
2J42	7	9375±30	Fixed	6.3	0.5	5.5	4.5	.0025	3	Weather radar systems, airborne search radar systems and in military and commercial marine radar systems.
2J42H	7	9375±30	Fixed	6.3	0.5	5.5	4.5	.002	3	
L-4644	7	9375±30	Fixed	6.3	0.6	5.2	4.5	.001	3	
L-4601B	8	9375±30	Fixed	6.3	0.6	5.5	4.5	.001	3.0	
L-3635	10	9375±30	Fixed	6.3	1.2	6.0	6.0	.002	3¾	Available with warranted operation for 1000 hours. Application in commercial weather radar systems.
L-3431A	18	9375±30	Fixed	6.3	1.2	7.0	7.0	.001	3¾	
L-3654A	24	9375±30	Fixed	6.3	1.2	8.0	8.25	.001	3¾	
L-3890A	24	9375±30	Fixed	6.3	1.2	8.0	8.25	.001	3¾	
L-3168	30	9375±30	Fixed	12.6	2.3	12.5	10.0	.002	6	For airborne applications. Other fixed frequency versions of the 4J52A are available on request.
6510	65	9375±30	Fixed	12.6	2.3	15.0	15.0	.001	6	
4J52A	70	9375±30	Fixed	12.6	2.3	15.0	15.0	.001	6	
L-3219	70	9400±30	Fixed	12.6	2.3	15.0	15.0	.001	6	
L-3156	112	9375±30	Fixed	13.75	3.2	19-21	16	.002	10	Used in systems requiring multi-frequency operation; especially suitable for airborne fire control.
4J50A	225	9375±30	Fixed	13.75	3.35	21.5	27.5	.001	10	
L-3030D	330	9375±30	Fixed	13.75	3.37	26.29	27.5	.001	14	This high power version of 4J50 is designed for component testing and is not recommended for system applications.
L-4193C	90	8500-9600	Mechanical	13.75	3.2	21	13	.0025	11	Low power versions are for beacon applications; Medium power versions are for terrain avoidance and search radar systems; and high power versions are for ground and airborne multi-purpose radar installations.
7006	190	9000-9600	Mechanical	13.75	3.2	21.5	27.5	.0013	11	
L-4193A,H/ 7008	200	8500-9600	Mechanical	13.75	3.1	21.5	27.5	.0011	11	
M-4193B/ 7692	200	9200-9550	Mechanical	13.75	3.1	21.5	27.5	.0011	11	
7111	200	8500-9600	Mechanical	13.75	3.1	21.5	27.5	.0011	10	
L-4502*	200	8700-9400	Mechanical	13.75	3.1	21.5	23.5-27.5	.0013	12	
7950	208	8500-9600	Mechanical	20.0	4.0	33	24	.0013	16	
5780	250	8500-9600	Mechanical	20.0	4.0	33	32	.001	16	

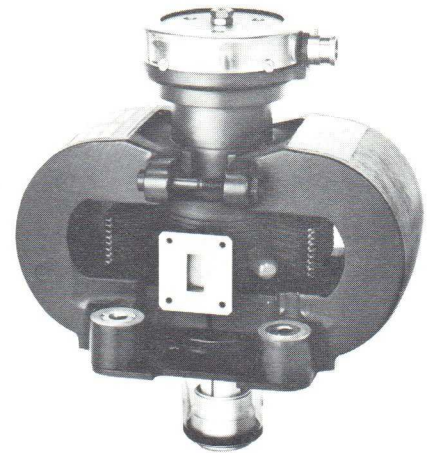
*Temperature Compensated



6543 5 1/3" High



L-5049 6" High



7208B 7 7/8" High

Pulse Magnetrons

I-BAND VANE & STRAP

Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-3103	30.0	8500-9600	Mechanical	12.6	2.3	12.5	10.0	.002	6 1/8	Extensive life testing of the 6543, I-band magnetron has demonstrated a capability of more than 1000 hours of stable performance under rugged cycle operation. The L-3103 is recommended for systems requiring higher duty operation; the 6543A for MTI systems requiring low jitter performance.
L-4503A	65.0	9600-10,125	Mechanical	12.6	2.3	15.0	15.0	.001	6 1/8	
6543	65.0	8500-9600	Mechanical	12.6	2.3	15.0	15.0	.001	6 1/8	
6543A	65.0	8500-9600	Mechanical	12.6	2.3	15.0	15.0	.001	6 1/8	

J-BAND COAXIAL

Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-3950	60	16,500 ± 100	Fixed	12.6	2.5	16	16	.001	6	Applications include weather, fire control, terrain following and navigation radar systems.
L-5434	70	15,920 ± 80	Fixed	4.8	11.0	24.0	12.0	.002	23.0	
L-3976	100	16,500 ± 150	Fixed	12.6	2.5	16	16	.001	6	
L-4419	65	16,500 ⁺¹²⁵ ₋₉₀	Fixed	12.6	2.6	15	16	.001	5	This magnetron features a special cathode design providing exceptional life and reliability for airborne systems.
L-4451	35	16,600-17,100	Tunable	12.6	1.7	12.5	9.5	.001	5	This tube is "screwdriver tunable" permitting presetting of frequency for airborne systems.
L-5049	50	16,145-16,805	Mechanical	12.6	1.9	12.5	11.0	.001	3 1/2	For weather and surveillance radar, airborne, missile and pulse doppler systems, where light weight is required.
L-5079	30	16,000-17,000	Mechanical	12.6	1.8	12.5	11	.003	3 1/4	These medium and high power magnetrons are designed for use in sophisticated new systems. Characteristics include reduced mode competition, very low pushing and missing pulses, and increased reliability.
L-3987	60	16,000-17,000	Mechanical	12.6	2.5	16	16	.001	6	
L-5042	80	16,000-16,500	Mechanical	12.6	2.5	16	16	.001	5	
L-5115	100	16,400-16,600	Mechanical	12.6	2.5	18	18	.0008	7	
7208	100	15,800-17,200	Servo-tunable	12.6	3.5	18	17	.001	14	
7208B	125	15,500-17,500	Servo-tunable	12.6	2.5	18	19	.001	14	



L-5115 5½" High



L-4516 6¹⁵/₁₆" High



L-5365 5½" High

Pulse Magnetrons

J-BAND VANE & STRAP

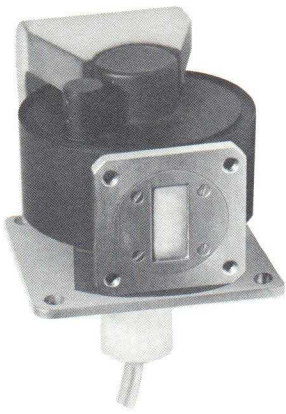
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-3083A	60	16,000-17,000	Mechanical	12.6	2.4	17.0	16.0	.001	6 ¹ / ₈	Featuring long life and reliable performance, these magnetrons are rated for 1.0 microsecond pulse operation.
L-3101A	60	16,000-17,000	Mechanical	12.6	2.4	17.0	16.0	.001	5 ³ / ₄	
L-3978	70	16,000-16,500	Mechanical	12.6	2.4	17.0	16.0	.001	5 ³ / ₄	

K-BAND COAXIAL

Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-4555	65.0	32,100-33,100	Mechanical	6.3	3.5	16.0	16.0	.001	10.0	For use in precision, forward looking, airborne radar systems. Provides greatly improved frequency stability.

K-BAND RISING SUN

Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-4154/ 7449A	65	24,000 ± 100	Fixed	5.0	3.1	14	25	.001	7.3	Specially designed cathode to meet highly exacting shock and vibration conditions. Ideally suited for surveillance and missile applications.
7619	40	34,860 ± 348	Fixed	12.6	2.8	11.5	20	.001	9	Used in automatic landing systems, reconnaissance and mapping radar systems, side looking radar systems and portable, field type radar systems.
L-4296/ 8366	50	33,200 ± 200	Fixed	12.6	2.8	12	25	.001	10 ¹ / ₂	
L-4064A	125	34,850 ± 150	Fixed	6.3	3.5	19	27	.001	9	
L-4494	20	34,500-35,210	Fixed	11.0	2.6	12	10	.0011	7	Excellent operating frequency stability and mode stability under severe environmental conditions assure reliable performance in airborne reconnaissance and mapping radar systems.
L-4564	50	32,850-33,150	Mechanical	6.3	3.5	18	13	.001	9 ¹ / ₂	
L-4516	100	34,700-34,930	Mechanical	6.3	3.5	17-21	27	.001	9 ¹ / ₂	
L-4540	100	34,700-34,930	Mechanical	6.3	3.5	17-21	27	.001	9 ¹ / ₂	



L-4642 3.54" High



L-4555 7³/₄" High



L-3225A 2⁵/₈" High

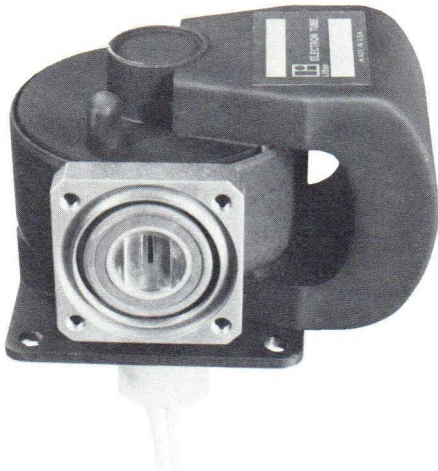
Miniature Pulse Magnetrons

I-BAND COAXIAL

Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-5274B	7.5	9345±20	Fixed	6.3	1.65	4.3	4.5	.0013	2.75	Specifically designed for new generation lightweight, airborne weather radar systems.
L-4652B	8.7	9345±20	Fixed	6.3	1.65	4.35	4.75	.0013	2.75	
L-5362B	10	9345±20	Fixed	6.3	1.65	5.0	5.0	.001	2.75	
L-4667	8.6	9375±5	Fixed	6.3	1.65	4.35	4.75	.0012	3.0	Specially suited for applications requiring low frequency drift. This tube features narrow range frequency adjustment in addition to a temperature coefficient of 75 KHz/°C.
L-4642	10.4	9375±5	Fixed	6.3	1.65	5.0	5.0	.0005	3.0	

I-BAND VANE & STRAP

Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-3028D	0.12	9280-9330	Mechanical	6.3	0.50	.80	0.55	.027	1.0	Designed for beacon and transponder applications these tubes provide stable operation with coded pulse groups.
L-5104	0.12	9290-9310	Mechanical	6.3	0.50	.80	0.55	.027	1.0	
L-3601	0.12	9315-9340	Mechanical	6.3	0.50	.80	0.55	.027	1.0	
L-3798	0.30	8520-8550	Mechanical	6.3	0.50	.55	0.30	.001	1.0	
L-3225A	1.0	9310-9350	Mechanical	6.3	0.50	2.8	1.33	.003	1.0	
L-5145	1.0	9275-9295	Mechanical	6.3	0.50	2.8	1.33	.003	1.0	
L-3381	3.0	8800-9500	Mechanical	6.3	0.90	3.60	3.25	.001	1.4	For beacons, transponders, and small radar systems. Features quick warm-up, extremely short pulse operation and stable frequency operation.



L-4652B 3 1/2" High



L-3496B 3.44" High



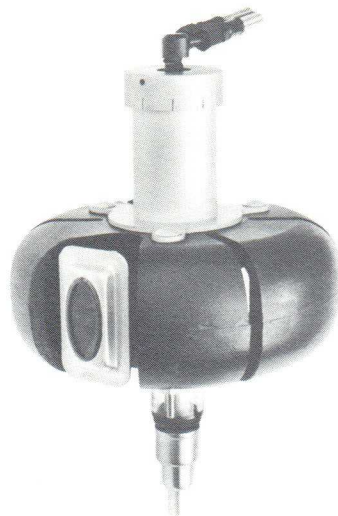
L-5328 4 3/16" High

Miniature Pulse Magnetrons

J-BAND COAXIAL

Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-5409**	2.5	15,400-15,700	Mechanical	6.3	1.5	3.6	3.0	.005	4.0	For microwave landing systems.
L-3958	9.0	15,500±85	Fixed	6.3	1.6	5.0	5.0	.003	2.5	Applications include weather, fire control, terrain following and navigation radar systems.
L-3958A*	9.0	15,500±85	Fixed	6.3	1.6	5.0	5.0	.003	2.5	
*Same performance as L-3958, but includes cathode connector flying leads for high altitude use.										
L-5383	0.2	16,200-16,300	Mechanical	4.75	0.6	1.9	.75	.0021	2.0	Applications include surveillance radar, airborne and missile systems, and pulse doppler systems.
L-5383A*	0.2	16,200-16,300	Mechanical	4.75	0.6	1.9	.75	.0021	2.0	
L-5271	0.8	16,200-16,300	Mechanical	4.75	0.6	2.8	.75	.0005	2.0	
L-3496B**	1.0	16,000-16,500	Mechanical	4.7	0.70	3.0	1.60	.003	1.2	
L-5013	4.0	15,500-16,500	Mechanical	6.3	1.6	4.50	3.5	.001	3	
L-5035	8.0	15,900-16,400	Mechanical	6.3	1.6	5.00	6.0	.003	3	
L-5329	8.0	16,000-16,200	Mechanical	6.3	1.6	4.75	6.0	.004	3.25	
* Same electrical performance as L-5383, but capable of withstanding 200G shock										
L-5328**	2.5	15,400-15,700	Mechanical	6.3	2.0	3.6	3.0	.005	3.0	Capable of wide duty cycle range without heater programming. Has low temperature coefficient.

**Temperature Compensated



L-3461 11½" High



L-3463 10½" High



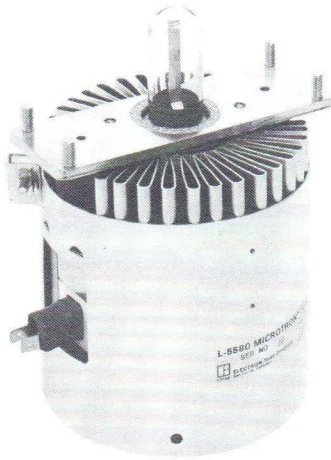
SOCKET

CW/Pulse Magnetrons and Accessories

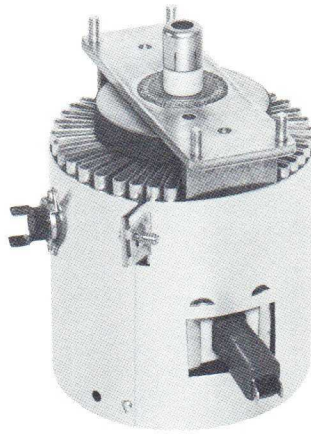
CW/PULSE MAGNETRONS

Tube Type	Tunable Frequency (MHz)	Min. CW Power (W)	Nominal CW Characteristics		Min. Pulse Power (kw)	Nominal Pulse Characteristics		Cooling	Max. Height (in.)	Max. Weight (lbs.)	Applications/Comments
			Eb (kv)	Ib (ma)		eb (kv)	ib (a)				
L-3456	350-590	200	4.0	200	—	—	—	Liquid	10½	18	Two families of Litton Industries' CW/Pulse Magnetrons, intended for CW, modulated CW, or high duty pulse operation, provide power from 175 to 500 watts average and 1.2 to 1.8 kilowatts peak within the frequency range of 350 to 10,475 MHz. All tubes are equipped with tuning knobs. Filaments require 93 watts; standby filament voltage is rated nominally at 5.5 volts. Each tube within a series is interchangeable with the exception of the rf output fitting. Tubes with an "A" suffix provide CW and pulse characteristics; those without a suffix provide CW operation, only.
L-3714	475-725	175	3.0	200	—	—	—	Liquid	10½	18	
L-3459	590-975	200	4.0	200	—	—	—	Liquid	10½	18	
L-3465/A	975-1500	400	4.0	300	1.5	4.6	0.8	Liquid	10½	18	
L-3464/A	1500-2350	400	4.0	325	1.2	5.0	0.8	Liquid	10½	18	
L-3460/A	2350-3575	500	4.0	300	1.8	4.7	0.8	Liquid	10½	18	
L-3461/A	3575-4975	350	4.0	250	1.5	4.7	0.8	Liquid	10½	18	
L-3467/A	4975-6175	400	4.2	250	1.5	4.9	0.8	Liquid	10½	18	
L-3468/A	6175-7275	300	4.2	200	1.5	4.7	0.8	Liquid	10½	18	
L-3462/A	7275-8775	300	4.3	250	1.5	5.0	0.8	Liquid	10½	18	
L-3463/A	8775-10,475	250	4.3	200	1.2	5.2	0.6	Liquid	10½	18	

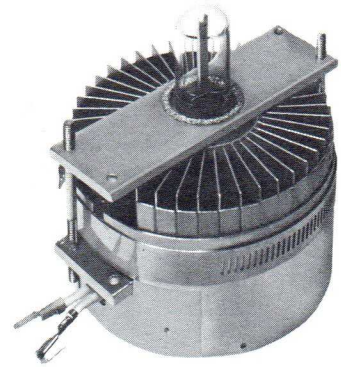
As a service to magnetron users, Litton offers a wide variety of magnetron-to-transmission line transitions and sockets.



L-5580 6.6" High



L-5580A 5.9" High



L-5261A 4 7/8" Wide

CW Magnetrons

MICROTRON® POWER TUBES

Tube Type	RF Power Flat Load (W)	RF Power In Cavity (W)	Anode Voltage Pk. (kv)	Anode Current Avg. (mA)	Filament Power (W)	Efficiency Flat Load %	Cooling Method	Magnet Type	General Use	Applications/Comments
L-3858	2650	2000	7.2	560	130	67	Liquid	Electromagnet	Industrial	Litton Industries Electron Tube Division offers a variety of CW magnetrons for microwave heating and cooking applications. All tubes operate within the ISM band and are fitted for antenna feed into waveguide. The L-3189 and L-3858 are designed to be used in conjunction with an electromagnet and separate RFI filter box, while all other tubes listed are supplied with permanent magnets and an integral RFI filter. When operated at cavity power levels less than 750 watts, the tubes can be used in systems requiring simultaneous application of plate and filament voltage. Engineering services are available, as well as consultation regarding specific applications.
L-3189	1350	927	7.0	300	80	70	Liquid	Electromagnet	Commercial	
L-5001A	950-1700	650-1200	3.55	400-725	92	68	Forced Air	Permanent	Commercial	
L-5260A	1000	700	3.70	400	73	68	Forced Air	Permanent	Domestic	
L-5261A	850	625	3.65	360	73	65	Forced Air	Permanent	Domestic	
L-5580	850	625	4.0	300	45	71	Forced Air	Permanent	Domestic	
L-5580A	850	625	4.0	300	45	71	Forced Air	Permanent	Domestic	

SALES OFFICES

Main sales offices and applications engineering services for Litton magnetrons are located at 1035 Westminster Drive, Williamsport, Pennsylvania 17701. Phone (717) 326-3561 or TELEX 841430.

Electron Tube Division sales offices are listed below:

EAST

1770 Walt Whitman Road
Melville, L.I., New York 11746
(516) 694-8300

DISTRICT OF COLUMBIA

490 L'Enfant Plaza East, S.W.
Suite 8206
Washington, D.C. 20024
(202) 554-2570

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(912) 923-3397

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(513) 258-1243

SOUTHWEST

13999 Goldmark Dr.
Suite 323
Dallas, Texas 75240
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WEST

960 Industrial Road
San Carlos, California 94070
(415) 591-8411

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(811) 980547

Via Arco 4
I 20121 Milan, Italy
(2) 89.33.62

95 High Street
Slough, Buckinghamshire
SL1 1DH, England
Slough 28267

Fack
S-100 51 Stockholm 28
Sweden
(8) 142345

Steenloperstraat 26
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(010) 50.39.02

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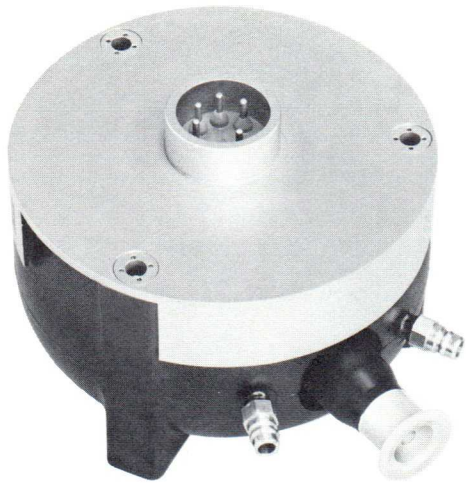
DENLEN ELECTRONICS CORP., LTD.
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Thornhill, Ontario, Canada L3T 2A1
(416) 889-7201

WESTREX COMPANY, ORIENT
Central P.O. Box 760
Tokyo, Japan
211-6791

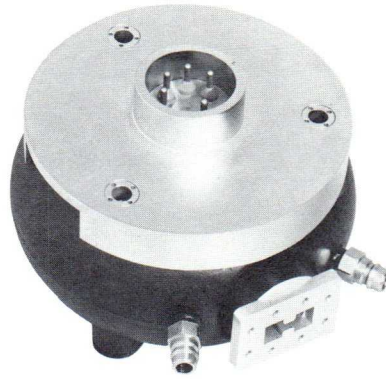
M.T.I. ENGINEERING, LTD.
182 Ben Yehuda Street
Tel-Aviv, Israel
03-236334



ELECTRON TUBE DIVISION
San Carlos, California • Williamsport, Pennsylvania



L-3721 7 5/8" Wide



L-3726 6 5/8" Wide



L-5317 6 1/4" Wide

M-Type Backward Wave Oscillators

Litton produces M-BWO's in three power families. In addition to the tubes shown below, extensive development work has been done on several classified types, for which information can be made available on a "need-to-know" basis.

All Litton M-BWO's are highly efficient and easy to operate. Tube types within each family are designed to function at similar low voltages and

currents, and have similar mounting dimensions. This makes it possible to operate with common power supplies and mounting. In the liquid cooled medium and high power series, the higher frequency tubes all use ridged, broadband waveguide, while the lower frequency tubes use 7/8 inch coaxial outputs. All conduction cooled miniature tubes use type N outputs. All Litton M-BWO's have 6.3 volt filaments.

MEDIUM POWER, LIQUID COOLED

Tube Type	Tunable Frequency (MHz)	Minimum Power (W)	INPUT RATINGS (with respect to cathode)									Maximum Weight (lbs.)
			Delay Line		Accelerator		Sole			Grid		
			E_{b2} (Kv)	I_{b2} (mA)	E_{b1} (Kv)	I_{b1} (mA)	E_{s0} (Kv)	+ E_{s0} Max. (V p-p)	I_{s0} (mA)	E_c (V)	I_c (mA)	
L-3721	1000-1400	200	2.3-4.0	300	.90-1.9	0-+3	-.90-3.4	1800	-20-+5	-100-+700	-3-+3	27
L-3724A	2500-3550	235	2.3-4.0	300	.90-1.9	0-+3	-.90-3.4	1800	-20-+5	-100-+700	-3-+3	16
L-3729A	4360-5910	220	2.3-4.0	300	.90-1.9	0-+3	-.90-3.4	1800	-20-+5	-100-+700	-3-+3	16
L-3726	4800-6550	165	2.3-4.0	275	.90-1.9	0-+3	-.90-3.4	1800	-20-+5	-100-+700	-3-+3	16
L-3728	8500-11,500	125	2.3-4.0	275	.90-1.9	0-+3	-.90-3.4	1800	-20-+5	-100-+700	-3-+3	16

MINIATURE, CONDUCTION COOLED

Tube Type	Tunable Frequency (MHz)	Minimum Power (W)	INPUT RATINGS (with respect to cathode)									Maximum Weight (lbs.)
			Delay Line		Accelerator		Sole			Grid		
			E_{b2} (Kv)	I_{b2} (mA)	E_{b1} (Kv)	I_{b1} (mA)	E_{s0} (Kv)	+ E_{s0} Max. (V p-p)	I_{s0} (mA)	E_c (V)	I_c (mA)	
L-5316	2600-3500	100	1.9-3.4	210	1.0-2.0	0-+3	-.87-2.3	1200	-10-+5	0-500	-2-+2	7
L-5317	4700-6200	100	1.9-3.4	210	1.0-2.0	0-+3	-.87-2.3	1200	-10-+5	0-500	-2-+2	7
L-5318	8500-9500	100	1.9-2.7	180	1.1-2.1	0-+3	-.87-2.3	1200	-10-+5	0-500	-2-+2	7

HIGH POWER, LIQUID COOLED

Information is available on a "need-to-know" basis, only.

SALES OFFICES

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Melville, L.I., New York 11746
(516) 694-8300

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(202) 554-2570

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960 Industrial Road
San Carlos, California 94070
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Oberföhringerstrasse 8
8 Munich 80, West Germany
89-98.05.47

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I 20121 Milan, Italy
2-89.33.62

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Fack
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Sweden
8-142345

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2903 AP Capelle a/d Yssel
Holland
10-503902

Gubelstrasse 28
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1-48.35.44

DENLEN ELECTRONICS CORP., LTD.

23 Guardsman Road
Thornhill, Ontario, Canada L3T 2A1
(416) 889-7201

WESTREX COMPANY, ORIENT

Central P.O. Box 760
Tokyo, Japan
211-5726

M.T.I. ENGINEERING, LTD.

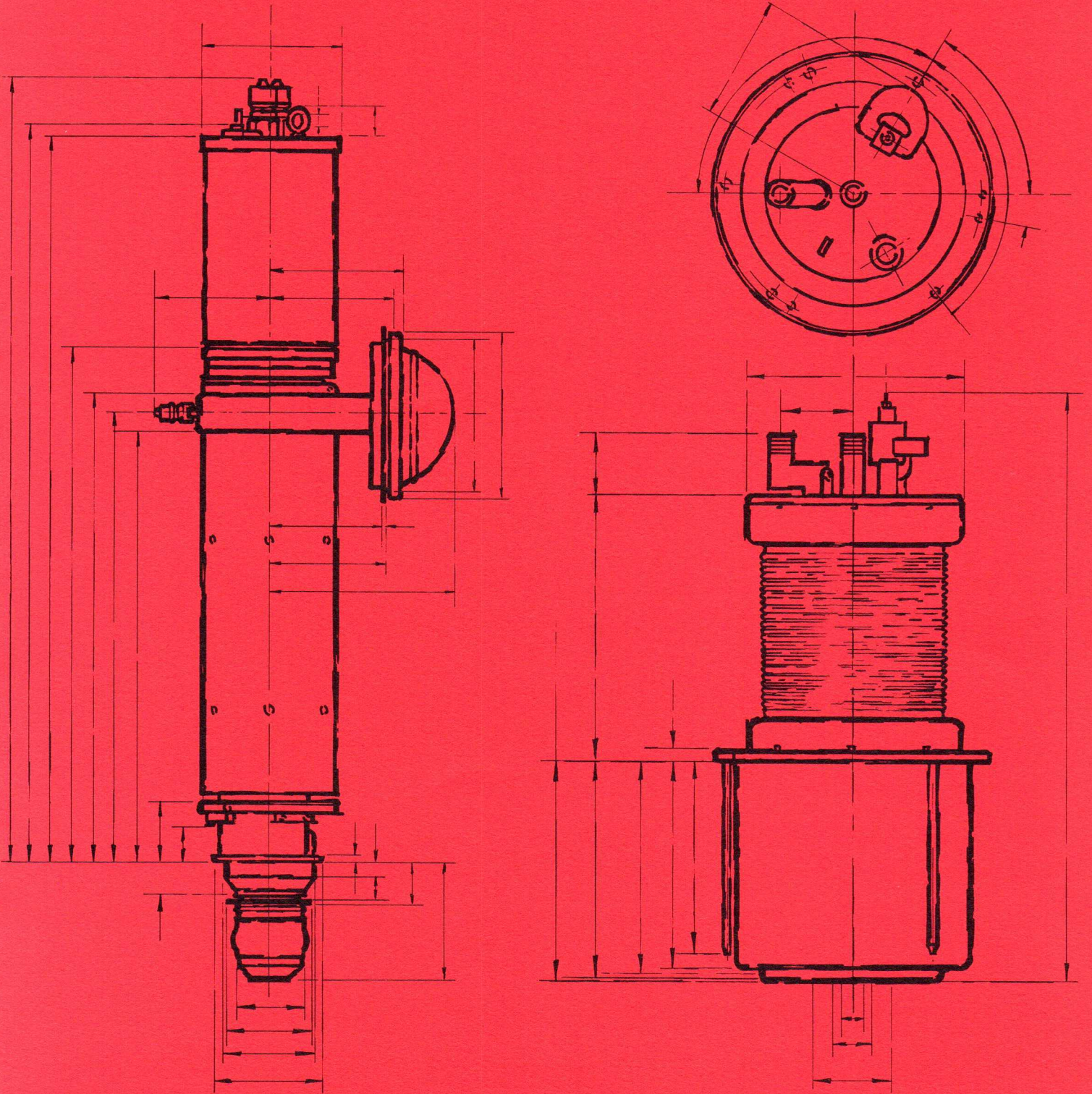
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ELECTRON TUBE DIVISION
San Carlos, California

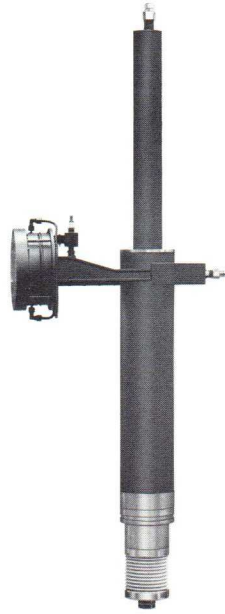
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Litton Klystron/Switch Tube Product Summary





L-3403 120" High



L-3661 70" High



L-5081 100" High

Amplifier Klystrons

PULSED, MODULATING ANODE

Tube Type	Frequency Range (MHz)	Tuning	Min. Peak Power Output (Mw)	Average Power Output (kW)	Pulse Width Cathode (μ sec)	Min. Gain (dB)	Typical Operating Values			Focus Coil Model	Applications/Comments
							Beam Voltage (kV)	Beam Current (amps)	Mod. Anode Voltage Peak (kv)		
L-3403	400- 450	Mechanical	1.25	75	2100	35	105	32.5	55	190	This group has proven long life and reliability in long range radar applications.
L-3694	400- 450	Mechanical	1.25	75	2100	35	108	35	55	190	
L-5120	805	Fixed	1.25	150	1000	45	75	40	75	489	Specially designed for particle accelerator applications.

PULSED

Tube Type	Frequency Range (MHz)	Tuning	Min. Peak Power Output (Mw)	Average Power Output (kW)	Pulse Width Cathode (μ sec)	Min. Gain (dB)	Typical Operating Values		Focus Coil Model	Applications/Comments
							Beam Voltage (kV)	Beam Current (amps)		
L-3742	2980-3100	Broadband	1*	6	10	35	90	52		Very high peak and average power with 1.0 dB power flatness across the frequency band. Gain in excess of 50 dB is available.
*Minimum over indicated band.										
L-3035	1240-1360	Tunable	2.2	7.6	8	36	115	78	201377	These tubes are available in standard production with established performance. Increased power is available with additional engineering effort.
L-3250	1250-1350	Tunable	10	15	7	36	185	160	46	
L-5096	1450-1550	Tunable	2.2	7.6	8	36	115	78	201377	
L-3943	1295-1305	Fixed	5	10	8	36	140	105	46	These klystrons are modifications of tunable tubes, designed for special applications, including particle accelerators.
L-3944	1295-1305	Fixed	10	15	8	36	210	150	46	
L-3660	1295-1305*	Fixed	10	20	32	33	175	171	200	
L-3661	1290-1310*	Fixed	20	20	10	45	225	260	215	
L-3661-01	1290-1310*	Fixed	20	30	10	45	225	260	215	
L-5081	1295-1305*	Fixed	30	75	12	45	290	300	203	

*Fixed tuned to a point within this range.



L-5012 22" High



L-5097 30 1/8" High

Reflex Klystrons

BROADBAND DISC SEAL KLYSTRONS

Type Tube	Reflector Mode	Frequency (MHz)	Resonator Voltage (Vdc)	Reflector Voltage (Vdc)	Cathode Current (mA _{dc})	CW Power Output (mW)	Control Electrode		Applications/Comments
							Voltage During Operation (Vdc)	Bias Voltage (Vdc)	
6BM6	1 3/4	550-2300	325	-235 (1500 MHz)	21	170 (1500 MHz)	0	-	Litton Industries reflex klystrons provide long, reliable service in receiver local oscillators, low power transmitters, traffic monitoring and control radar, laboratory test equipment and airborne weather radars. For use with an external cavity these disc seal klystrons have a maximum seal temperature of 175°C. In pulsed operation, the control electrode voltage is pulsed from the indicated bias level to the indicated operating voltage.
	2 3/4	1100-3000	325	-220 (2200 MHz)	21	100 (2200 MHz)	0	-	
	3 3/4	1500-3800	325	-210 (3000 MHz)	21	40 (3000 MHz)	0	-	
6BM6A	1 3/4	550-2300	325	-235 (1500 MHz)	21	170 (1500 MHz)	0	-300	
	2 3/4	1100-3000	325	-220 (2200 MHz)	21	100 (2200 MHz)	0	-300	
	3 3/4	1500-3800	325	-210 (3000 MHz)	21	40 (3000 MHz)	0	-300	
6BL6	1 3/4	1400-4000	325	-230 (2500 MHz)	26	250 (2500 MHz)	0	-	
	2 3/4	2100-4600	325	-140 (3200 MHz)	26	125 (3200 MHz)	0	-	
	3 3/4	3000-6500	325	-200 (5000 MHz)	26	30 (5000 MHz)	0	-	

High Voltage Switch Tubes

Tube Type	Hold-off Collector Voltage (kVac)	Peak Collector Current (A)	Tube Drop @ I _C (kV)	Average Collector Dissipation (kW)	Peak Mod. Anode Voltage (kV)	Pulse Width (μs)	E _f (V)	I _f (A)	Weight (lbs.)	Cooling	Applications/Comments
L-5012	135	25	15	10	14	20	12	6	45	Water	The INJECTRON® is a high vacuum, high voltage switch tube that greatly extends the voltage operating range of pulse modulators. Applications include floating deck modulators, series switching and voltage or current regulation. These rugged metal and ceramic tubes are capable of 95% switching efficiencies and fast rise times with low control power levels. They provide extremely high holdoff voltages, low voltage drop at operating current, high plate dissipation and pentode-like constant current characteristics over a broad operating range.
L-5033	165	50	17	30	14	10	12	9	540	Oil	
L-5097	165	50	17	60	11	30	12	9	540	Water	

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DISTRICT OF COLUMBIA 490 L'Enfant Plaza East, S.W. Suite 8206 Washington, D.C. 20024 (202) 554-2570	MIDWEST 4130 Linden Avenue Suite 270 Dayton, Ohio 45432 (513) 258-1243	WEST 960 Industrial Road San Carlos, California 94070 (415) 591-8411

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DENLEN ELECTRONICS CORP., LTD. 23 Guardsman Road Thornhill, Ontario, Canada L3T 2A1 (416) 889-7201	WESTREX COMPANY, ORIENT Central P.O. Box 760 Tokyo, Japan 211-6791	M.T.I. ENGINEERING, LTD. 182 Ben Yehuda Street Tel-Aviv, Israel 03-236334
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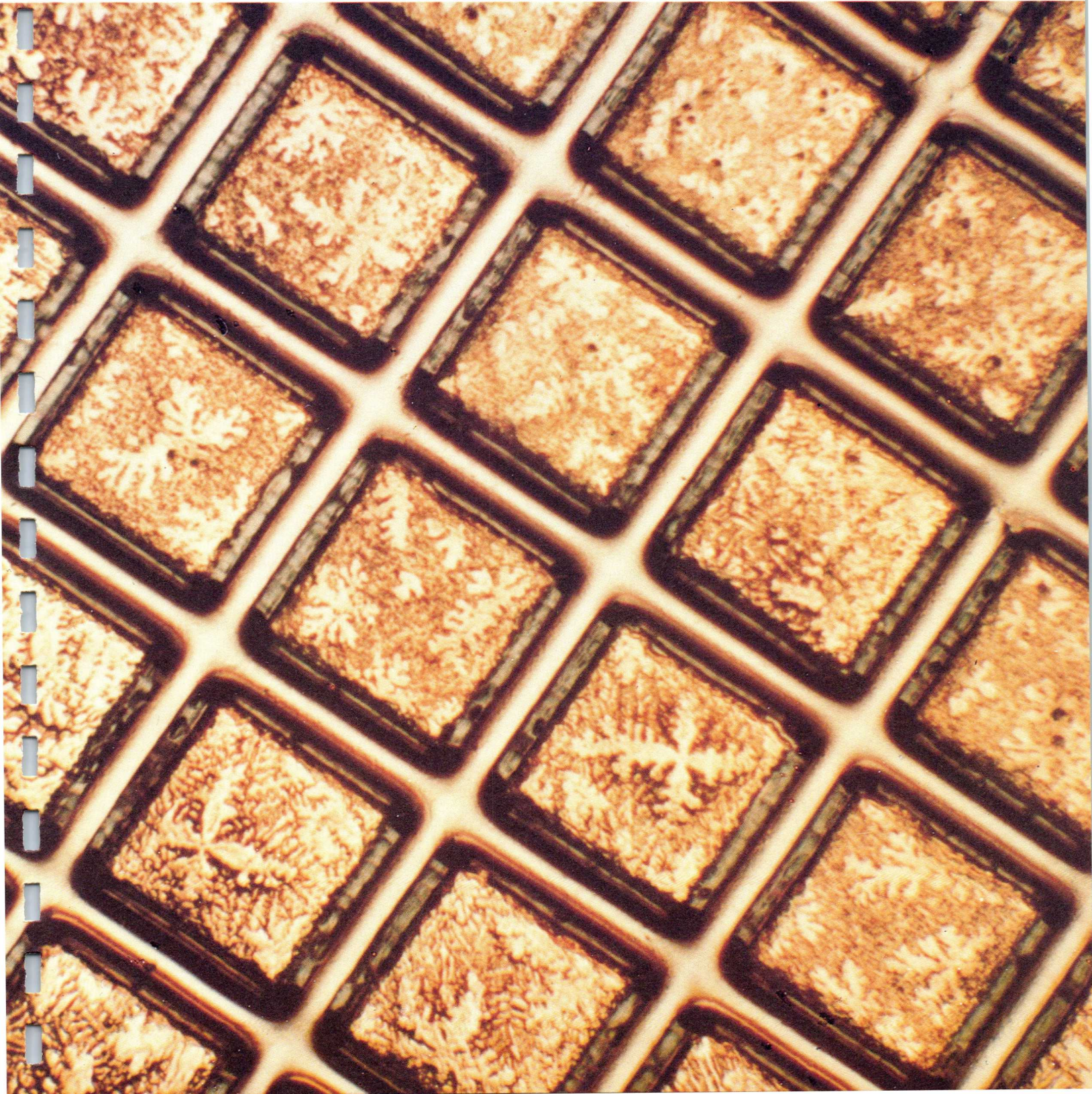


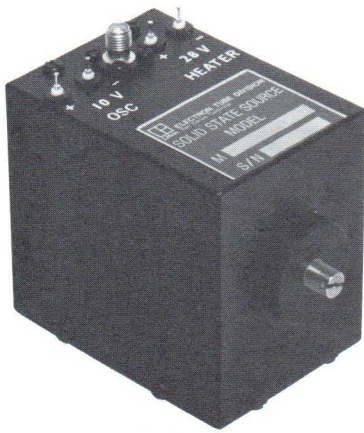
ELECTRON TUBE DIVISION
San Carlos, California

Litton

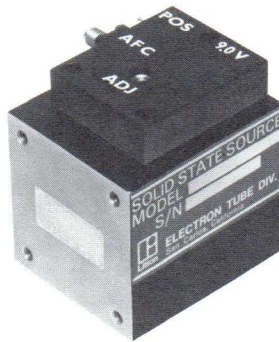
Microwave Solid-State Devices

Gunn-Effect Oscillators & Injection Locked Amplifiers

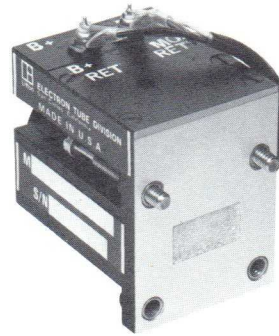




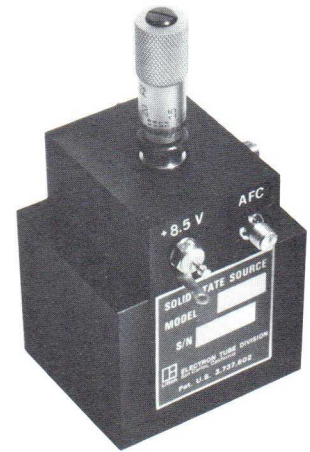
Temperature Stabilized Oscillator
M-1026-01 3" High



Radar Local Oscillator
M-1006-01 2" High



Doppler Navigation Radar
Transmitter
M-1027-01 2 1/4" High



Microwave Radio Voltage Controlled
Oscillator M-1033-01
2 1/4" High (Excluding Tuner)

MECHANICALLY AND ELECTRONICALLY TUNED OSCILLATORS

Type No.	Frequency (GHz)	Minimum Power Output (mW)	Tuning Range, Mechanical (MHz)	Tuning Range, Electrical (MHz)	Typical Tuning Voltage (V)	Typical Bias Voltage (Vdc)	Typical Bias Current (A)	Output Connector	Approx. Weight (oz.)	Applications/Comments
M-1014-07	6.80-7.03	5	225	±15	-1 to -20	-11.0	0.3	WG	12	This Series of mechanically tuned Gunn diode sources provides output powers to 2 watts within the 7.0 to 18.0 GHz frequency range. Some models have electronic tuning capability with up to 100 MHz bandwidth. They are suitable as replacements for reflex klystrons in radars, communications and test equipment, and are available with or without an integral power supply/regulator or load isolator.
M-1014-06	6.80-7.03	200	225	±15	-1 to -20	12.0	1.3	WG	24	
M-1037-00	6.87-7.12	1000	250	±15 ²	-15 to -35	12.0	4.0	WG	24	
M-1015-01	7.4-8.0	5	600	±15	-1 to -20	-12.0	0.4	WG	12	
M-1015-02	7.4-8.0	200	600	±15	-1 to -20	12.0	2.0	WG	24	
M-1020-02	7.99-8.34	200	350	±15	-1 to -20	10.0	2.0	WG	16	
M-1014-05	8.34-8.59	5	250	±15	-1 to -20	-10.5	0.4	WG	10	
M-1020-01	8.34-8.59	200	250	±15	-1 to -20	9.5	2.0	WG	16	
M-1041-01	8.50-9.20	5	700	±15	-1 to -20	-10.0	0.4	WG	10	
M-1042-01	8.50-9.20	200	700	±15	-1 to -20	9.5	2.0	WG	16	
M-1006-01	9.39-9.45	30	60	60	2 to 50	9.5	0.4	WG	8	
M-1041-00	9.17-9.97	5	800	±15	-1 to -20	-10.0	0.4	WG	10	
M-1042-00	9.17-9.97	200	800	±15	-1 to -20	9.5	2.0	WG	16	
M-1043-00	9.36-9.48	7	120	63	0 to 13	10.5	0.15	WG	1	
M-1029-01	9.2-10.2	500	1000	±15	-1 to -20	9.5	2.0	WG	16	
M-1014-01	9.23-10.23	5	1000	±15	-1 to -20	-9.5	0.4	WG	10	
M-1014-02	9.23-10.23	200	1000	±15	-1 to -20	10.0	2.0	WG	16	
M-1030-01	9.9-10.3	20	400	±5	-1 to -15	-10.0	0.5	WG	10	
M-1014-03	10.23-10.73	5	500	±15	-1 to -20	-9.5	0.4	WG	10	
M-1014-04	10.23-10.73	200	500	±15	-1 to -20	10.0	2.0	WG	16	
M-1005-01	10.7-11.7	1000	1000	80	0 to 60	10.0	5.0	WG	18	
M-1016-02	10.7-11.7	2000	1000	110	0 to 70	9.5	10.0	WG	15	
M-1041-02	10.73-11.33	5	600	±15	-1 to -20	-9.0	0.4	WG	10	
M-1018-04	10.73-11.33	200	600	±15	-1 to -20	9.0	2.0	WG	16	
M-1018-02	11.23-11.78	5	550	±15	-1 to -20	-9.5	0.4	WG	10	
M-1018-01	11.23-11.78	200	550	±15	-1 to -20	9.5	2.0	WG	16	
M-1033-00	12.5-12.8	200	300	±15	-1 to -20	8.5	2.5	WG	16	
M-1038-00	12.7-13.25	1000	550	±15 ²	-15 to -35	8.5	4.8	WG	18	
M-1027-01	13.32	50	±75	.06	1 (p-p)	12.0 ¹	0.5	WG	12	
M-1033-01	12.97-13.82	200	850	±15	-1 to -20	8.5	2.5	WG	16	
M-1023-01	15.7	750	Preset	110	0 to 70	7.0	5.0	WG	12	
M-1007-01	15.9-16.4	2	500	60	5 to 25	7.0	0.3	WG	6.5	

Notes: 1. Integral voltage regulator 2. ±3% linearity over 10 MHz

MECHANICALLY TUNED OSCILLATORS

Type No.	Frequency (GHz)	Minimum Power Output (mW)	Tuning Range, Mechanical (MHz)	Typical Bias Voltage (Vdc)	Typical Bias Current (A)	Output Connector	Approx. Weight (oz.)	Applications/Comments
M-1009-01	4.3	30	100	20.0	0.5	SMA	6	Litton coaxial and high Q waveguide cavity oscillators are available in field adjustable and factory preset frequency versions. They utilize Litton-made Gunn diodes whose low AM and FM noise performance characteristics are well suited for local oscillator applications. Frequency stability is assured through one of several stabilizing techniques, depending on the application, including bimetal temperature compensation, a proprietary dielectric technique, and/or heater temperature controller stabilization. Options available on request include integral RF isolators, voltage regulators, and temperature controlled heaters.
M-1010-01	7.8	30	100	12.0	0.4	SMA	8	
M-1026-01	7.9-8.4	10	500	10.0 ¹ 28.0 ³	0.5 1.0 ⁴	SMA	17	
M-1036-00	8.5	10	Preset	15.0 ^{1,2} 28.0 ³	0.4 1.7 ⁴	SMA	9	
M-1045-00	8.5-9.6	15	1100	11.0	0.5	WG	16	
M-1047-00	9.3	8.5	Preset	18.0	0.4	SMA	10	
M-1011-01	9.6	30	100	11.0	0.4	SMA	6	
M-1011-02	11.3	30	100	10.0	0.5	SMA	6	
M-1012-01	13.1	30	100	9.0	0.5	SMA	6	
M-1027-02	13.3	100	±5	12.0 ²	1.0	WG	12	
M-1013-02	14.0	30	100	7.0	0.6	SMA	6	
M-1046-00	14.0	200	±50	15.0	1.8	SMA	15	
M-1012-02	14.8	30	100	8.0	0.6	SMA	6	
M-1035-00	16.0	10	Preset	15.0 ^{1,2} 28.0 ³	0.6 1.7 ⁴	SMA	8	
M-1012-03	16.8	30	100	7.0	0.7	SMA	6	
M-1013-01	18.4	30	±100	8.0	0.7	SMA	6	

Notes: 1. Integral heater and temperature controller 2. Integral voltage regulator 3. Heater voltage 4. Heater current

INJECTION LOCKED AMPLIFIERS

Type No.	Frequency (GHz)	Minimum Power Output (mW)	Tuning Range, Mechanical (MHz)	Minimum Locking Bandwidth (MHz)	Typical Bias Voltage (Vdc)	Typical Bias Current (A)	Output Connector	Approx. Weight (oz.)	Applications/Comments
M-1002-03	5.92-6.52	1250	600	±22	12.0	5.0	WG	21	These Litton injection locked amplifiers utilize Gunn diodes to provide broadband, high power, low noise, low voltage operation. These amplifiers may be single knob tuned over bandwidths up to 10%. Locking gain is greater than 17 dB. Litton ILA's are supplied with or without the following: (1) integral circulator; (2) voltage regulator; (3) over-voltage protection.
M-1002-01	6.87-7.12	1250	250	±30	9.5	5.0	WG	16	
M-1002-05	7.1-7.8	1250	700	±30	11.5	5.0	WG	16	
M-1002-04	7.7-8.5	1250	800	±30	12.0	5.0	WG	16	
M-1002-02	8.27-8.50	1250	225	±35	9.5	5.6	WG	21	
M-1001-01	10.7-11.7	1250	1000	±35	9.5	5.0	WG	16	
M-1001-02	11.7-12.2	1250	500	±35	9.0	5.0	WG	16	
M-1001-04	12.2-12.8	1250	600	±35	9.5	5.0	WG	16	
M-1001-03	12.7-13.25	1250	550	±35	9.0	5.0	WG	16	
M-1039-00	12.7-13.25	65	Preset	±25	9.0	0.5	SMA	8	
M-1003-03	13.325	300*	±15	20	18.0	1.0	WG	10	
M-1034-00	14.0-14.3	1000	300	±35	7.5	6.0	WG	16	
M-1034-01	14.40-15.25	1000	850	±35	7.0	6.0	WG	16	

*Peak Power; Pulse Length 1.5µs; 50% duty

Litton Industries produces a broad line of solid-state microwave products for a wide variety of applications. Because we maintain an on-going development program, new products are continually being added to our line. We invite you to contact us for information on new devices and components to meet your solid-state microwave requirements.

About the Cover . . .

Our photo shows a greatly enlarged portion of a partially processed slice of epitaxial Gallium Arsenide. Each of the square mesas will eventually become the active element in an individually packaged Gunn-effect diode, produced by Litton Electron Tube Division. At this stage, the mesas have been defined by a photolithograph process and have been plated with a gold-based alloy. The edge of each mesa is approximately .008" long.

SALES OFFICES

Main marketing offices and applications engineering services are located at 960 Industrial Road, San Carlos, California 94070. Phone (415) 591-8411 or TWX 910-376-4900.

Your nearest Litton solid-state sales representative is:

Sales outside the United States are handled through the following companies:

LITTON PRECISION PRODUCTS INTERNATIONAL

58 Rue Pottier
78150 Le Chesnay, France
955.21.04

Oberföhringerstrasse 8
8 Munich 80, West Germany
(811) 980547

Via Arco 4
I 20121 Milan, Italy
(2) 89.33.62

95 High Street
Slough, Buckinghamshire
SL1 1DH, England
Slough 28267

Fack
S-100 51 Stockholm 28
Sweden
(8) 142345

Steenloperstraat 26
Capelle a/d Yssel
Holland
(010) 50.39.02

Gubelstrasse 28
8050 Zurich, Switzerland
(051) 48.35.44

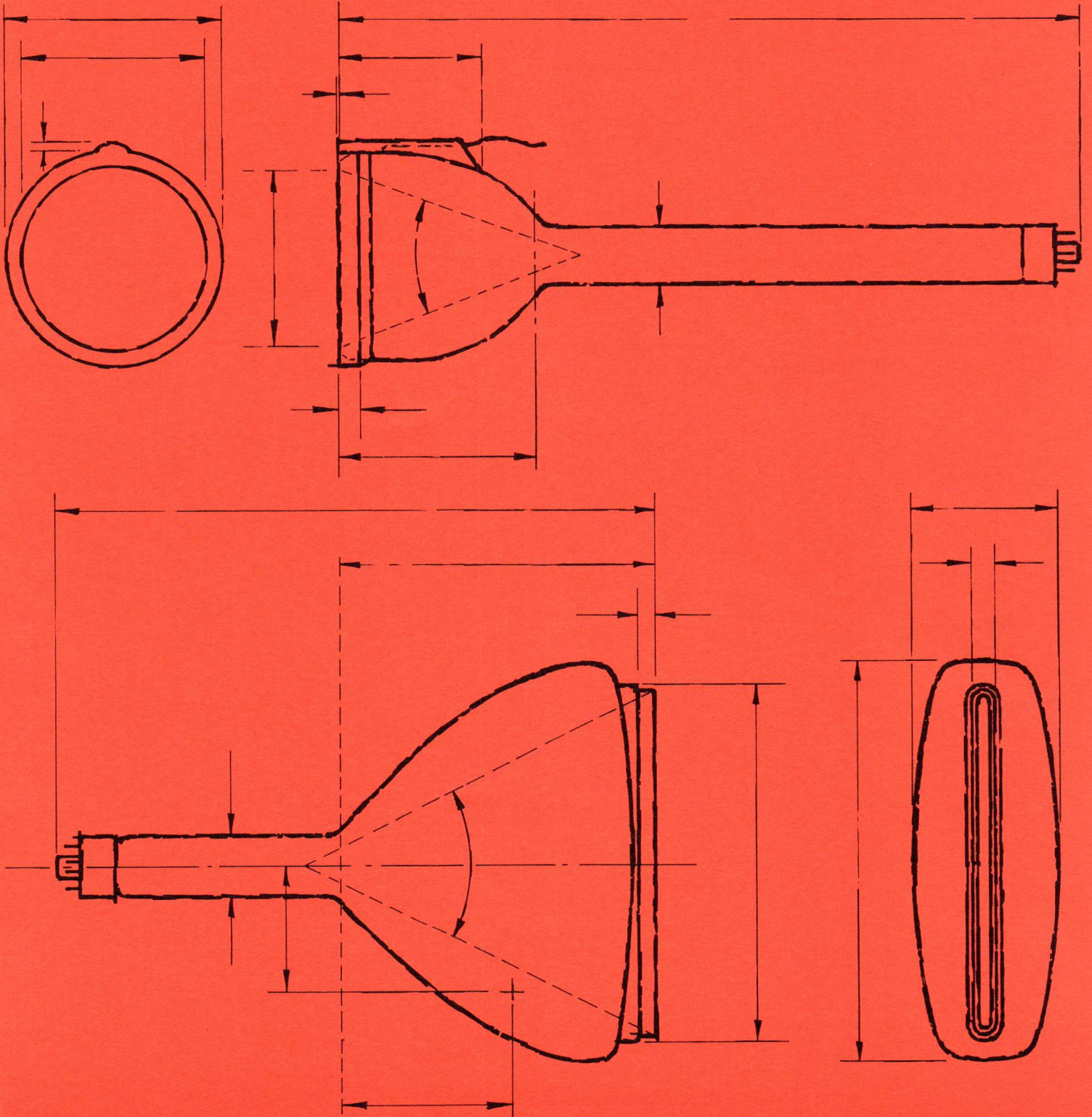
DENLEN ELECTRONICS CORP., LTD.
23 Guardsman Road
Thornhill, Ontario, Canada L3T 2A1
(416) 889-7201

WESTREX COMPANY, ORIENT
Central P. O. Box 760
Tokyo, Japan
211-6791

M. T. I. ENGINEERING, LTD.
182 Ben Yehuda Street
Tel-Aviv, Israel
03-236334



Litton Cathode Ray Tube Product Summary





L-4256 19½" Long



L-4190 14⅝" Long



L-4285 21" Long

FLAT FACE CATHODE RAY TUBES

Electro-magnetic Deflection and Focus for Recording and Scanning

Type Number	Nominal Face Size	Gun Type	Deflection Angle	Applications and/or Special Characteristics	Spot Size	
					2-Slit Analyzer-50%	SRM*
L-4108	5" diameter	"A"	40°	Available for projection		.0013"
L-4119	5" diameter	"A"	40°	Special P24		.0014"
L-4114	5" diameter	"S"	40°	Airborne, ruggedized		.001"
L-4123	5" diameter	"S"	40°		.0011"	.0008"
L-4238	5" diameter	"SS"	40°		.0008"	
L-4256	5" diameter	"L"	40°		.0006"	
L-4251	5" diameter	"S"	26°	Low cost "COM" tube		.0012"
L-4125	5" diameter	"S"	24°		.0015"	
L-4246	5" diameter	"L"	20°		.0008"	
L-4248-03	5" diameter	Special	40°	Low cost tube		.001"
L-4197	7" diameter	"A"	40°			.0015"
L-4104	7" diameter	"S"	40°			.0008"
L-4236	7" diameter	"SS"	40°		.0008"	
L-4290	7" diameter	Special	40°			.0013"
L-4192	9" diameter	"S"	40°			.001"
L-4192-01	9" diameter	"L"	40°	Used for artwork generation	.001"	
L-4275	9" diameter	Special	40°		.0008"	
L-4273	10" diameter	Special	50°	Low cost, large diameter		.002"

*Shrinking Raster Measurement

NOTE: Detailed specifications are given on individual data sheets, where available. All screens are metalized. All measurements on P11 at 0.50 to 1.0μa beam current. "A" Gun—Medium High Resolution; High Current. "S" Gun—High Resolution. "SS" Gun—Extra-High Resolution. "L" Gun—Ultra-High Resolution.



L-4192-01 26" Long



PL-4146-03 17 1/2" Long



PL-4190 19" Long

FLAT FACE CATHODE RAY TUBES

Electrostatic Focus, Electro-magnetic Deflection for Recording and Scanning.

Type Number	Nominal Face Size	Deflection Angle	Applications and/or Special Characteristics	Spot Size	
				2-Slit Analyzer-50%	SRM
L-4146	5" diameter	40°		.0015"	
L-4249	5" diameter	26°	Low cost "COM" tube		.0025"
L-4248	5" diameter	40°	Low cost "COM" tube		.002"
L-4146-03	5" diameter	40°		.00065"	
L-4268	7" diameter	40°	High brightness		.003"

FIBER OPTIC CATHODE RAY TUBES

Electro-magnetic Focus. Special shapes available.

Type Number	Size	Shape	Screen Dimensions	Gun Type	Deflection Angle	Special Characteristics	Spot Size
L-4167	8 1/2"	Line scan	8 1/4" x 3/16"	"A"	55°		.0015"
L-4186	9 1/4"	Line scan	9 1/4" x 3/16"	"A"	60°		.0015"
L-4196	3"	Line scan	2 7/16" x 3/16"	"S"	36°	Cylindrical Outside Face	.0008"
L-4183	5"	Line scan	4 3/8" x 3/8"	"S"	40°		.0008"
L-4199	5"	Round	4 1/4" dia.	"S"	40°		.0008"
L-4271	9 1/4"	Line scan	9 1/4" x 3/16"	"SS"	60°		.001"

Electrostatic Focus. Special shapes available.

L-4282	5"	Round Bottle	5" x 1/2"	ES	40°		.001"
L-4285	8"	Rect. scan	8 1/4" x 1 1/2"	ES	55°		.0012"
L-4190	8 1/2"	Line scan	8 1/4" x 3/16"	ES	55°		.003"
L-4190-02	8 1/2"	Line scan	8 1/4" x 3/16"	ES	55°		.0015"
L-4283-03	10"	Line scan	10" x 1/2"	ES	55°		.0025"
L-4254	11 1/4"	Line scan	11 1/4" x 5/16"	"S"	60°		.0015"

PRE-PACKAGED CATHODE RAY TUBES

with pre-aligned deflection coil, magnetic shield, and, where required, focus coil ready for use.

Type Number	Nominal Face Size	Gun Type	Deflection Angle	Applications and/or Special Characteristics	Spot Size	
					2-Slit Analyzer-50%	SRM
PL-4183	5" strip	"S"	40°	EM focus; L-4183 fiber optic CRT		.0008"
PL-4146-03	5" diameter	ES	40°	ES focus; L-4146-03 CRT	.00065"	
PL-4256	5" diameter	"L"	40°	EM focus; highest resolution	.0006"	
PL-4240	7" diameter	"A"	52°	EM focus; Radar Display; P7 phosphor		.005"
PL-4167-01	8¼" strip	"S"	55°	EM focus; L-4167-01 fiber optic line scan CRT		.001"
PL-4190	8¼" strip	ES	55°	Compact ES fiber optic CRT		.0015"

COLOR RECORDING

Most of the cathode ray tubes listed in this brochure are available for color recording. Please contact us for assistance in selecting the proper CRT for your application.

Litton offers a wide range of gun types, phosphors and envelope sizes, including various deflection angles. These can be mixed and selected to fit particular applications—without engineering charges. Please contact a Litton representative or applications engineer for assistance in matching a CRT to your requirement. An applications engineer can also aid in some aspects of system design and lens selection. In addition, Litton publishes applications notes and papers describing the use of high resolution cathode ray tubes in film recording and scanning systems, as well as other applications. Copies of these are available on request.

SALES/MARKETING OFFICES

Main marketing offices and applications engineering services are located at 960 Industrial Road, San Carlos, California 94070. Phone (415) 591-8411 or TWX 910-376-4900. Regional Marketing Offices are listed below:

EAST
1770 Walt Whitman Road
Melville, L.I., New York 11746
(516) 694-8300

DISTRICT OF COLUMBIA
490 L'Enfant Plaza East, S.W.
Suite 8206
Washington, D.C. 20024
(202) 554-2570

SOUTH
P.O. Box 00
Warner Robins, Georgia 31093
(912) 923-3397

MIDWEST
4130 Linden Avenue
Suite 100
Dayton, Ohio 45432
(513) 258-1243

SOUTHWEST
13999 Goldmark Dr.
Suite 323
Dallas, Texas 75240
(214) 234-1066

WEST
960 Industrial Road
San Carlos, California 94070
(415) 591-8411

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LITTON PRECISION PRODUCTS INTERNATIONAL

58 Rue Pottier
78150 Le Chesnay, France
955.21.04

Oberföhringerstrasse 8
8 Munich 80, West Germany
89-98.05.47

Via Arco 4
I 20121 Milan, Italy
2-89.33.62

95 High Street
Slough, Berkshire
SL1 1DH, England
753-28267

Fack
S-100 55 Stockholm 10
Sweden
8-142345

Steenloperstraat 26
2903 AP Capelle a/d Yssel
Holland
10-503902

Gubelstrasse 28
8050 Zurich, Switzerland
1-48.35.44

DENLEN ELECTRONICS CORP., LTD.
23 Guardsman Road
Thornhill, Ontario, Canada L3T 2A1
(416) 889-7201



WESTREX COMPANY, ORIENT
Central P.O. Box 760
Tokyo, Japan
211-5726

M.T.I. ENGINEERING, LTD.
182 Ben Yehuda Street
Tel-Aviv, Israel
3-236334



ELECTRON TUBE DIVISION
San Carlos, California

The radiation warning statements shown here are applicable to many of the products listed in this brochure. To determine the pertinent warnings for any device, please see the individual data sheet for that device. Additionally, all Litton Industries Electron Tube Division products are labeled with the appropriate radiation warnings.

 <p>A diamond-shaped sign with a black background and white border. The word "CAUTION" is written in white capital letters at the top, and "MICROWAVE RADIATION" is written in smaller white capital letters at the bottom.</p>	<p>Personnel should not be exposed to the microwave energy which may radiate from this device if improperly used or connected. All input and output microwave connections, waveguide flanges and gaskets must be microwave leak proof and properly engaged. Never operate this device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while this device is energized.</p>	<p>CAUTION</p>  <p>A black trefoil symbol (three-leaf clover shape) with a white circle in the center, representing X-ray radiation.</p> <p>X-RAYS</p> <p>This device may produce X-radiation when energized. Operating personnel must be protected by appropriate shielding. X-ray caution signs or labels should be permanently attached to equipment directing operating personnel never to operate this device without X-ray shielding in place.</p>
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