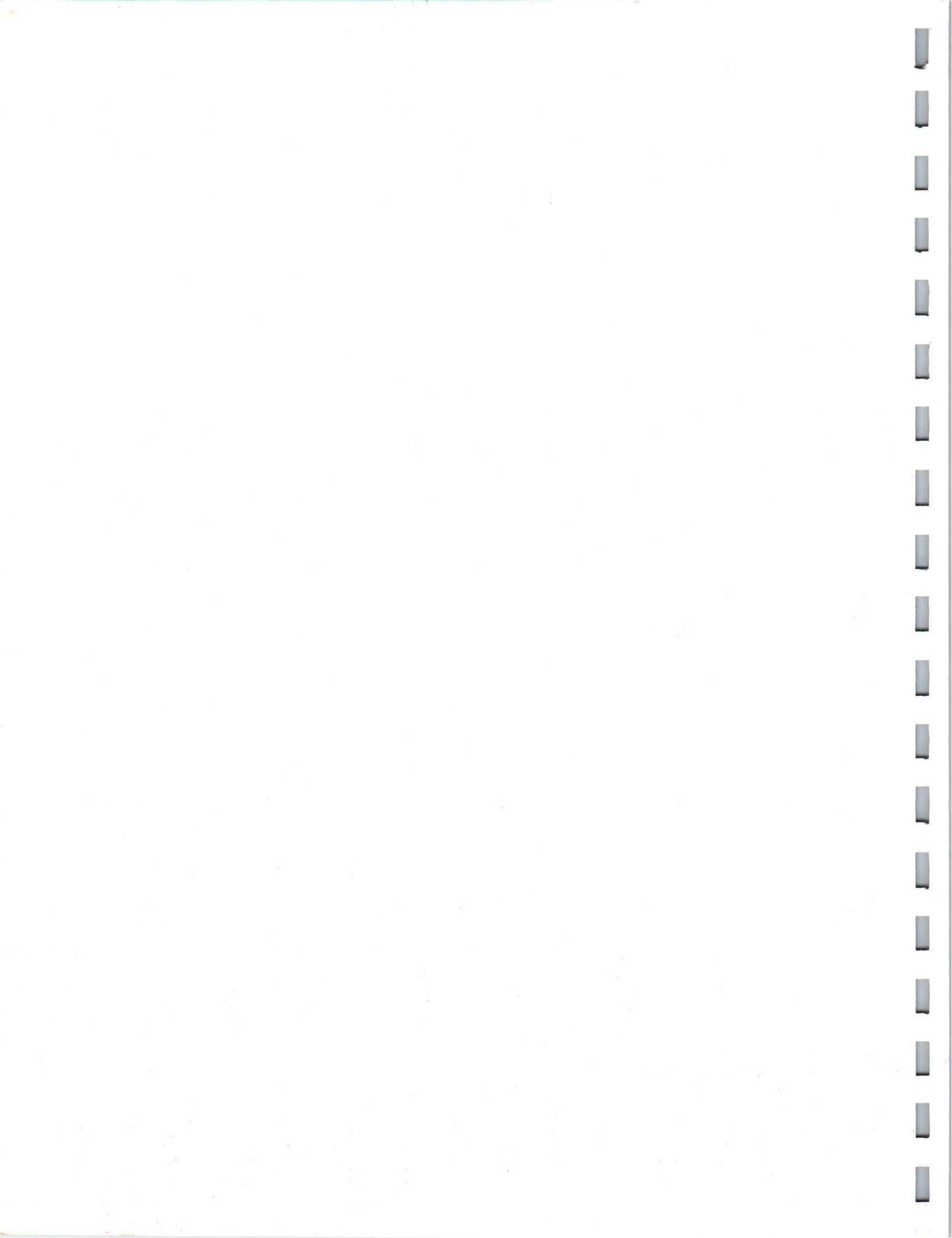


# Product Summary

LIT. 4



**ELECTRON TUBE DIVISION**  
San Carlos, California • Williamsport, Pennsylvania



# Product Summary



**ELECTRON TUBE DIVISION**  
San Carlos, California • Williamsport, Pennsylvania

# Product Listing by Number

Tube No.	Type	Section (Color)	Tube No.	Type	Section (Color)	Tube No.	Type	Section (Color)	Tube No.	Type	Section (Color)	Tube No.	Type	Section (Color)
* 2C36	Planar	Gray	* L-3030D	Mag.	Gray	L-3915	Mag.	Gray	* L-4502	Mag.	Gray	L-5316	MBWO	Gray
* 2C37	Planar	Gray	L-3035	Kly.	Blue	L-3928	TWT	Green	* L-4516	Mag.	Gray	L-5317	MBWO	Gray
* 2J42	Mag.	Gray	* L-3036A	Mag.	Gray	L-3943	Kly.	Blue	* L-4527	Mag.	Gray	L-5318	MBWO	Gray
* 2J42H	Mag.	Gray	* L-3036B	Mag.	Gray	L-3944	Kly.	Blue	* L-4553	Mag.	Gray	L-5320	TWT	Green
* 4J50A	Mag.	Gray	* L-3036F	Mag.	Gray	L-3950	Mag.	Gray	* L-4555	Mag.	Gray	L-5321	TWT	Green
* 4J52A	Mag.	Gray	* L-3039D	Mag.	Gray	L-3956	Mag.	Gray	* L-4558	Mag.	Gray	L-5322	TWT	Green
* 6BL6	R. Kly.	Blue	* L-3039E	Mag.	Gray	L-3957	TWT	Green	* L-4575	Mag.	Gray	L-5323	TWT	Green
* 6BM6	R. Kly.	Blue	* L-3039F	Mag.	Gray	L-3958	Mag.	Gray	* L-5001	CW Mag.	Gray	L-5324	TWT	Green
* 6BM6A	R. Kly.	Blue	* L-3039G	Mag.	Gray	L-3958A	Mag.	Gray	L-5007	TWT	Green	L-5328	Mag.	Gray
* 5767	Planar	Gray	* L-3039H	Mag.	Gray	L-3971	TWT	Green	L-5008	TWT	Green	L-5330	Mag.	Gray
* 5768	Planar	Gray	* L-3039I	Mag.	Gray	L-3972	TWT	Green	L-5009	TWT	Green	L-5332	CFA	Gray
* 5780	Mag.	Gray	* L-3039J	Mag.	Gray	L-3975	ESFK	Blue	L-5010	TWT	Green	L-5333	Mag.	Gray
* 6027	Mag.	Gray	* L-3039K	Mag.	Gray	L-3976	Mag.	Gray	L-5011	TWT	Green	L-5334	CFA	Gray
6344A	Mag.	Gray	* L-3039L	Mag.	Gray	L-3978	Mag.	Gray	L-5013	Mag.	Gray	L-5336	TWT	Green
* 6481	Planar	Gray	* L-3039M	Mag.	Gray	L-3987	Mag.	Gray	L-5014	TWT	Green	L-5339	TWT	Green
* 6503	Planar	Gray	* L-3039N	Mag.	Gray	L-3990	Mag.	Gray	L-5015	TWT	Green	L-5359	Mag.	Gray
* 6510	Mag.	Gray	* L-3039P	Mag.	Gray	L-3996	TWT	Green	L-5023	TWT	Green	L-5362	Mag.	Gray
* 6543	Mag.	Gray	* L-3039R	Mag.	Gray	L-3998	TWT	Green	L-5035	Mag.	Gray	L-5365	Mag.	Gray
* 6543A	Mag.	Gray	L-3083A	Mag.	Gray	* L-4064A	Mag.	Gray	L-5036	TWT	Green	L-5366	TWT	Green
* 7006	Mag.	Gray	L-3089B	Mag.	Gray	L-4104	CRT	Yellow	L-5042	Mag.	Gray	L-5371	CFA	Gray
* 7111	Mag.	Gray	L-3101A	Mag.	Gray	L-4108	CRT	Yellow	L-5043	TWT	Green	L-5372	CFA	Gray
7156A	Mag.	Gray	* L-3103	Mag.	Gray	L-4114	CRT	Yellow	L-5044	ESFK	Blue	L-5373	CFA	Gray
* 7208	Mag.	Gray	L-3105	Mag.	Gray	L-4119	CRT	Yellow	L-5045	TWT	Green	L-5380	TWT	Green
7208B	Mag.	Gray	* L-3156	Mag.	Gray	L-4123	CRT	Yellow	L-5047	Mag.	Gray	L-5383	Mag.	Gray
7460	Mag.	Gray	* L-3168	Mag.	Gray	L-4125	CRT	Yellow	L-5048	Mag.	Gray	L-5383A	Mag.	Gray
* 7503	Mag.	Gray	* L-3189	CW Mag.	Gray	L-4129-01	CRT	Yellow	L-5049	Mag.	Gray	L-5400	Mag.	Gray
* 7619	Mag.	Gray	* L-3219	Mag.	Gray	L-4141	CRT	Yellow	L-5079	Mag.	Gray	L-5407	Mag.	Gray
* 7950	Mag.	Gray	L-3225	Mag.	Gray	L-4142	CRT	Yellow	L-5080	Mag.	Gray	L-5408	CFA	Gray
L-2330-13	TWT	Green	L-3250	Kly.	Blue	L-4146	CRT	Yellow	L-5081	Kly.	Blue	L-5436	Mag.	Gray
L-2331-07	TWT	Green	L-3379	Mag.	Gray	L-4146-03	CRT	Yellow	L-5083	TWT	Green	L-5450	Mag.	Gray
L-2332-07	TWT	Green	L-3380	Mag.	Gray	* L-4154/7449A	Mag.	Gray	L-5089	TWT	Green	LS-1001	MSSS	Rust
L-2333-06	TWT	Green	L-3381	Mag.	Gray	L-4166	CRT	Yellow	L-5095	TWT	Green	LS-1002	MSSS	Rust
L-2333-08	TWT	Green	L-3382	Mag.	Gray	L-4167	CRT	Yellow	L-5096	Kly.	Blue	LS-1003	MSSS	Rust
L-2333-11	TWT	Green	L-3403	Kly.	Blue	L-4183	CRT	Yellow	L-5101	ESFK	Blue	LS-1101	MSSS	Rust
L-2335-16	TWT	Green	L-3431A	Mag.	Gray	L-4186	CRT	Yellow	L-5104	Mag.	Gray	LS-1102	MSSS	Rust
L-2335-17	TWT	Green	L-3456	CW Mag.	Gray	L-4188	CRT	Yellow	L-5113	Mag.	Gray	LS-1103	MSSS	Rust
L-2337-14	TWT	Green	L-3459	CW Mag.	Gray	L-4190	CRT	Yellow	L-5115	Mag.	Gray	LS-1104	MSSS	Rust
L-2337-18	TWT	Green	L-3460A	CW Mag.	Gray	L-4192	CRT	Yellow	L-5117	TWT	Green	LS-1301	MSSS	Rust
L-2337-23	TWT	Green	L-3461A	CW Mag.	Gray	L-4192-01	CRT	Yellow	L-5120	Kly.	Blue	LS-1401	MSSS	Rust
L-2338-20	TWT	Green	L-3462A	CW Mag.	Gray	* L-4193/7008	Mag.	Gray	L-5121	TWT	Green	LS-1402	MSSS	Rust
L-2339-03	TWT	Green	L-3463A	CW Mag.	Gray	* L-4193B/7692	Mag.	Gray	L-5126	TWT	Green	LS-1403	MSSS	Rust
L-2341-08	TWT	Green	L-3464A	CW Mag.	Gray	* L-4193C	Mag.	Gray	L-5134	TWT	Green	LS-1404	MSSS	Rust
L-2342-03	TWT	Green	L-3465A	CW Mag.	Gray	L-4196	CRT	Yellow	L-5145	Mag.	Gray	LS-1405	MSSS	Rust
L-2343-03	TWT	Green	L-3467A	CW Mag.	Gray	L-4197	CRT	Yellow	L-5149	Mag.	Gray	LS-1407	MSSS	Rust
L-2344-05	TWT	Green	L-3468A	CW Mag.	Gray	L-4198	CRT	Yellow	L-5154	TWT	Green	LS-1408	MSSS	Rust
L-2345-02	TWT	Green	L-3496A	Mag.	Gray	L-4199	CRT	Yellow	L-5155	TWT	Green	LS-1409	MSSS	Rust
L-2345-08	TWT	Green	L-3500	CW Mag.	Gray	L-4200	CRT	Yellow	L-5160	TWT	Green	LS-1410	MSSS	Rust
L-2347-05	TWT	Green	L-3501	CW Mag.	Gray	L-4201	CRT	Yellow	L-5182	ESFK	Blue	LS-1411	MSSS	Rust
L-2348-02	TWT	Green	L-3502A	CW Mag.	Gray	L-4210	CRT	Yellow	L-5189	Mag.	Gray	LS-1412	MSSS	Rust
L-2350-01	TWT	Green	L-3503A	CW Mag.	Gray	L-4216	CRT	Yellow	L-5195	ESFK	Blue	LS-1414	MSSS	Rust
L-2352-03	TWT	Green	L-3504A	CW Mag.	Gray	L-4221	CRT	Yellow	L-5200	Mag.	Gray	LS-1415	MSSS	Rust
L-2357-03	TWT	Green	L-3505A	CW Mag.	Gray	L-4236	CRT	Yellow	L-5209	Mag.	Gray	LS-1416	MSSS	Rust
L-2357-04	TWT	Green	L-3506A	CW Mag.	Gray	L-4238	CRT	Yellow	L-5218	TWT	Green	LS-1417	MSSS	Rust
L-2357-06	TWT	Green	L-3507A	CW Mag.	Gray	* L-4242	Mag.	Gray	L-5223	Mag.	Gray	LS-1418	MSSS	Rust
L-2364-01	TWT	Green	L-3508A	CW Mag.	Gray	L-4245	CRT	Yellow	L-5224	Mag.	Gray	LS-1419	MSSS	Rust
L-2364-05	TWT	Green	L-3509A	CW Mag.	Gray	L-4246	CRT	Yellow	L-5224A	Mag.	Gray	LS-1420	MSSS	Rust
L-2365-01	TWT	Green	L-3601	Mag.	Gray	L-4248	CRT	Yellow	L-5225	TWT	Green	LS-1421	MSSS	Rust
L-2365-03	TWT	Green	* L-3613	Mag.	Gray	L-4249	CRT	Yellow	L-5227	TWT	Green	LS-1422	MSSS	Rust
L-2366-01	TWT	Green	L-3635	Mag.	Gray	L-4251	CRT	Yellow	L-5229	Mag.	Gray	LS-1423	MSSS	Rust
L-2366-02	TWT	Green	L-3645	Mag.	Gray	L-4254	CRT	Yellow	L-5235	ESFK	Blue	LS-1424	MSSS	Rust
L-2780	TWTA	Green	L-3654A	Mag.	Gray	L-4256	CRT	Yellow	L-5237	ESFK	Blue	LS-1501	MSSS	Rust
L-2781	TWTA	Green	L-3660	Kly.	Blue	L-4257	CRT	Yellow	L-5248	ESFK	Blue	LS-1502	MSSS	Rust
L-2782	TWTA	Green	L-3661	Kly.	Blue	* L-4264	Mag.	Gray	L-5250	TWT	Green	LS-1503	MSSS	Rust
L-2783	TWTA	Green	L-3668W	ESFK	Blue	* L-4296/8366	Mag.	Gray	L-5252	TWT	Green	LS-1504	MSSS	Rust
L-2784	TWTA	Green	L-3694	Kly.	Blue	* L-4306	Mag.	Gray	L-5253	TWT	Green	LS-1505	MSSS	Rust
L-2785	TWTA	Green	L-3714	CW Mag.	Gray	* L-4310	Mag.	Gray	L-5255	TWT	Green	LS-1506	MSSS	Rust
L-2786	TWTA	Green	L-3721	MBWO	Gray	* L-4316	Mag.	Gray	* L-5260A	CW Mag.	Gray	LS-1508	MSSS	Rust
L-2787	TWTA	Green	L-3724A	MBWO	Gray	* L-4362/8468	Mag.	Gray	* L-5261A	CW Mag.	Gray	LS-1510	MSSS	Rust
L-2788	TWTA	Green	L-3726	MBWO	Gray	* L-4370	Mag.	Gray	L-5263	TWT	Green	PL-4146-03	CRT Package	Yellow
L-2789	TWTA	Green	L-3728	MBWO	Gray	* L-4419	Mag.	Gray	L-5265	Mag.	Gray	PL-4167-01	CRT Package	Yellow
L-2795	TWTA	Green	L-3729A	MBWO	Gray	* L-4451	Mag.	Gray	L-5271	Mag.	Gray	PL-4183	CRT Package	Yellow
L-2796	TWTA	Green	L-3742	Kly.	Blue	* L-4469/8855	Mag.	Gray	L-5273	Mag.	Gray	PL-4240	CRT Package	Yellow
L-2797	TWTA	Green	L-3798	Mag.	Gray	* L-4472	Mag.	Gray	L-5274	Mag.	Gray	Model 90674	CRT Mount	Yellow
L-2798	TWTA	Green	L-3813	Mag.	Gray	* L-4485	Mag.	Gray	L-5275	TWT	Green			
L-3028D	Mag.	Gray	L-3845	TWT	Green	* L-4490	Mag.	Gray	L-5280	TWT	Green			
* L-3030	Mag.	Gray	* L-3858	CW Mag.	Gray	* L-4494	Mag.	Gray	L-5281	TWT	Green			
* L-3030B	Mag.	Gray	L-3890A	Mag.	Gray	* L-4495	Mag.	Gray	L-5283	TWT	Green			
* L-3030C	Mag.	Gray	L-3897	Mag.	Gray	* L-4497	Mag.	Gray	L-5293	TWT	Green			

## TYPE DESIGNATIONS

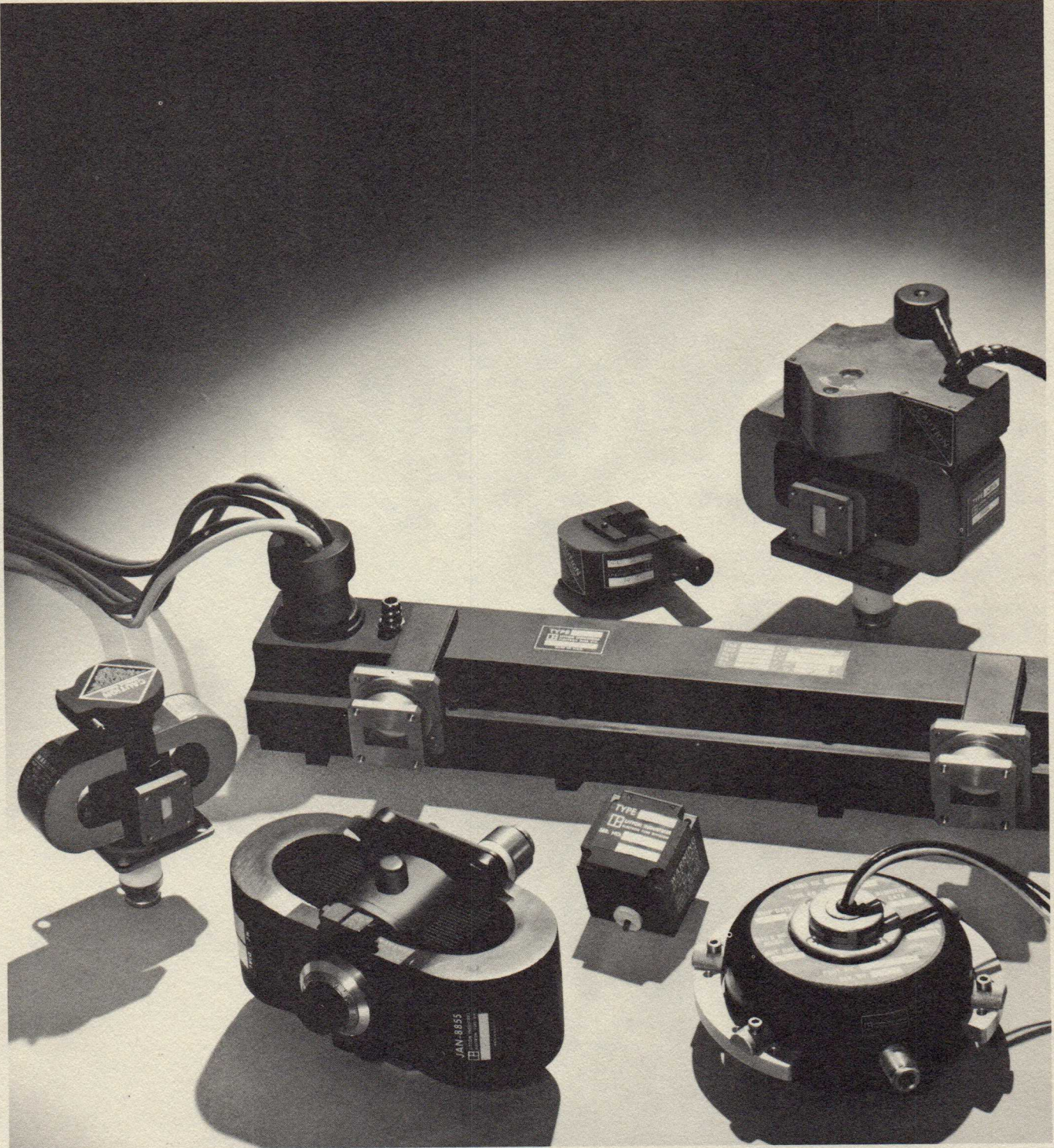
CFA—Crossed Field Amplifier	Kly.—Klystron	MSSS—Microwave Solid-State Source	TWT—Traveling Wave Tube
CW Mag.—Continuous Wave Magnetron	Mag.—Magnetron	Planar—Planar Triode	TWTA—Traveling Wave Tube Amplifier
ESFK—Electrostatically Focused Klystron	MBWO—M-type Backward Wave Oscillator	R. Kly.—Reflex Klystron	

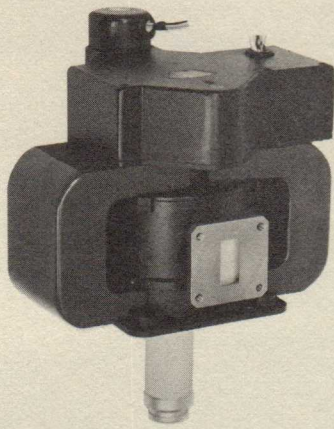
Note: Tube listings by power and center frequency are found at the back of this brochure.

\* These tubes manufactured by Williamsport Facility

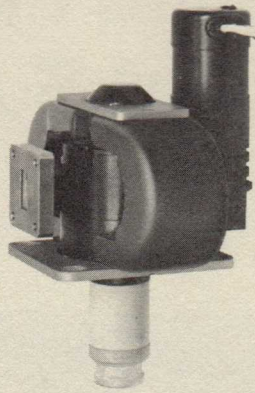


# Crossed Field Device Product Summary

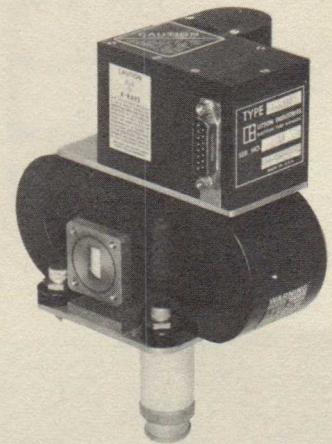




L-5224 7 $\frac{1}{16}$ " High



L-5223 6 $\frac{1}{4}$ " High



L-5330 7 $\frac{7}{8}$ " High

# Gyro-Tuned™ Pulse Magnetrons

## X-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			
X L-5407	75.0	9000-9500	200	150-200	12.6	2.0	15.0	15.0	.0011	12.5	
X L-5224	75.0	9100-9500	75	60-85	12.6	2.0	15.0	15.0	.0011	12.5	
X L-5224A	85.0	9000-9500	75	60-95	12.6	2.0	15.0	15.0	.0011	12.5	

## Ku-BAND COAXIAL — FIXED FREQUENCY

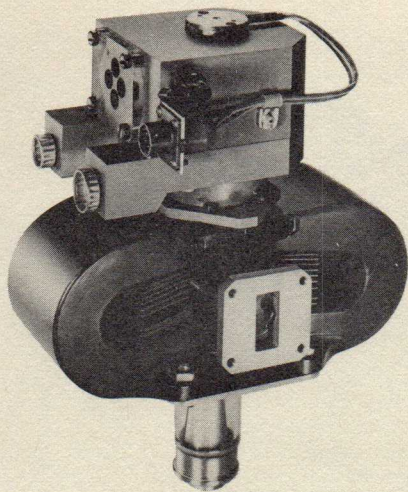
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	F/A Rate (Hz)	F/A Range (MHz)	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)
					Ef Volts	If Amps	eb kilovolts	ib amps		
+ L-5450	35.0	16,250 ± 25	200	240	12.6	1.7	13.0	11.0	.001	4.5
X L-5223	35.0	16,750 ± 125	200	200	12.6	1.7	13.6	11.0	.001	4.5
+ L-5229	35.0	16,850 ± 125	200	200	12.6	1.7	13.6	11.0	.001	4.5
+ L-5400	65.0	16,500 ± 125	200	200	12.6	2.2	15.0	15.0	.0012	7.0

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.

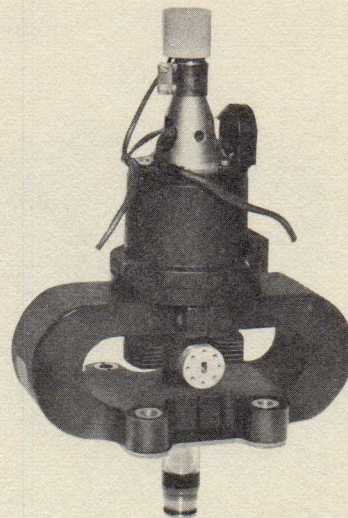
Gyro-tuning employs a ring gear which drives a set of rotating dielectric paddles within the magnetron coaxial cavity. A high speed, synchronous motor drives the entire mechanism, which is external to the tube vacuum envelope. The complete tuner assembly is compact and adds only 1/2 pound to the basic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

## Ku-BAND COAXIAL — TUNABLE

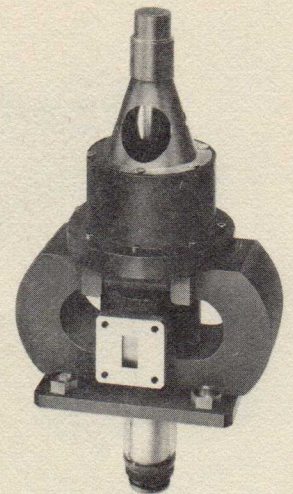
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	F/A Rate (Hz)	F/A Range (MHz)	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)
					Ef Volts	If Amps	eb kilovolts	ib amps		
X L-5200	35.0	16,000-17,000	200	200-300	12.6	1.7	13.0	11.0	.001	4.5
X L-5436	35.0	16,600-16,900	200	200-250	12.6	1.7	13.0	10.0	.001	4.5
X L-5330	60.0	16,000-17,000	200	20-50	12.6	2.2	15.6	15.0	.001	8.5



L-4310 10" High



L-4558 11 1/4" High



L-4527 10 1/16" High

# Rapid Tuned Pulse Magnetrons

## X-BAND

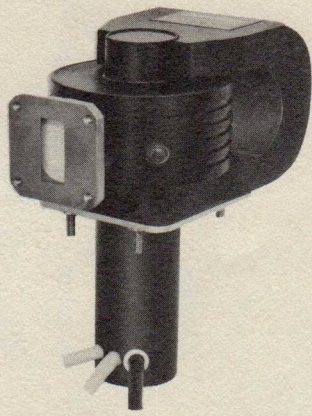
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-4310	200	8500-9400	Hydraulic	13.75	3.2	21.5	27.5	.0013	13 1/2	Provides high speed tuning with a turn-around time of less than 3.0 milliseconds for frequency agile radar systems. Its precise linear tuning simplifies problems of AFC tracking.

## Ku-BAND COAXIAL — ELECTROMAGNETICALLY TUNED

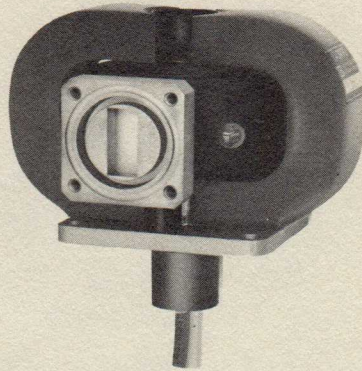
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-4527	65	16,200-16,800	Electromagnetic	12.6	2.4	13-15	14	.0015	7	Tunable over 600 MHz of Ku-band at rates up to 100 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.

## Ka-BAND COAXIAL — ELECTROMAGNETICALLY TUNED

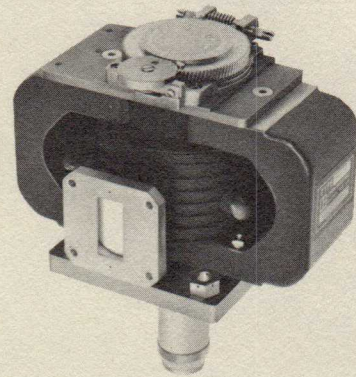
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
L-4558	65.0	32,100-33,100	Electromagnetic	6.3	3.5	16.0	16.0	.001	15.0	Tunable over 1000 MHz of Ka-band at rates up to 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-5047 6½" High



L-3990 4¾" High



L-5273 6⅞" High

# Pulse Magnetrons

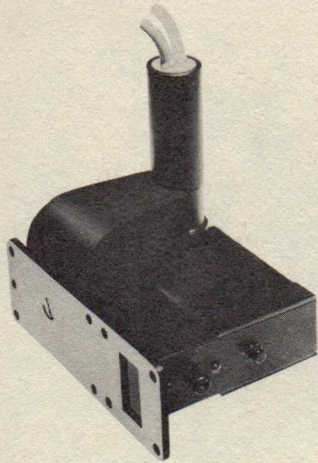
## C-BAND

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			
X 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	
X L-5080	250	5450-5825	Mechanical	5.0	5.0	25.0	25.0	.0012	35	

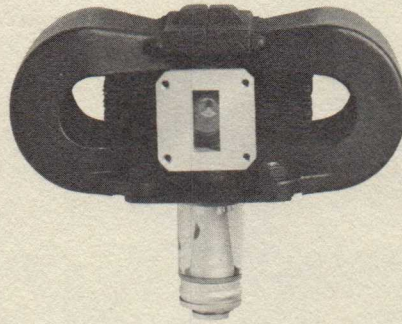
## X-BAND COAXIAL

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-5209	12.5	9200-9800	Mechanical	5.6	3.0	6.0	4.8	.0035	5.0	Capable of wide duty cycle range without heater programming. Has low temperature coefficient.
X L-3990	24.0	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.
X L-5365	28.0	9345±30	Fixed	12.6	1.15	8.5	8.5	.0015	4.5	
X L-5047	65.0	9375±30	Fixed	14.0	1.4	13.0	12.0	.001	7.5	
X L-5333	85.0	9000-9500	Mechanical	12.6	2.0	15.0	15.0	.0011	12.5	Recommended for new radar systems.
X L-5273	95.0	8500-9600	Mechanical	12.6	3.1	16.0	15.0	.0011	10.0	
X L-4553	65.0	9375±30	Fixed	12.6	2.2	15.0	15.0	.001	6.0	Direct replacement for type 4J52A magnetron.
X L-5149	200.0	8500-9600	Mechanical	13.75	3.2	22.0	22.0	.001	15.0	Coaxial design provides 50% efficiency.
X L-4469/8855	200.0	8500-9600	Mechanical	13.75	3.1	22.0	27.5	.0011	13.0	Direct replacement for type 7111 magnetron.
X L-4575	200.0	8500-9600	Mechanical	13.75	3.1	22.0	27.5	.0011	16.0	Direct replacement for type 7008 magnetron.

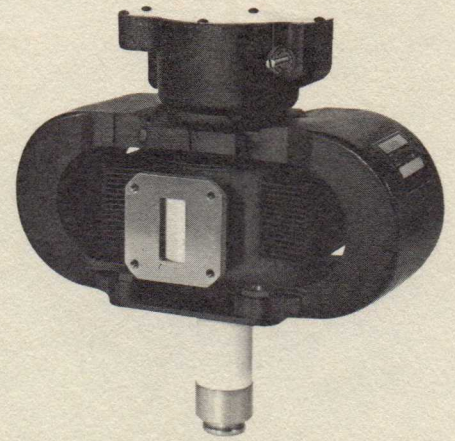




2J42H 5¼" High



L-3039 6¼" High

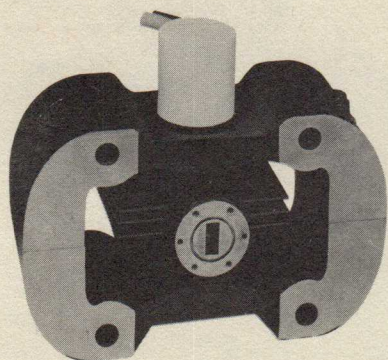


L-4575 8¼" High

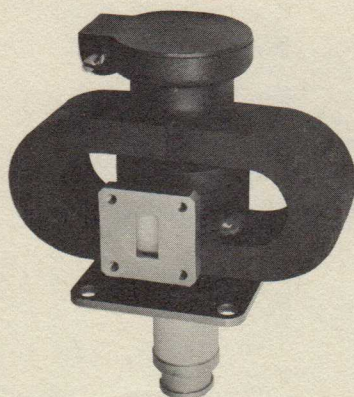
# Pulse Magnetrons

## X-BAND

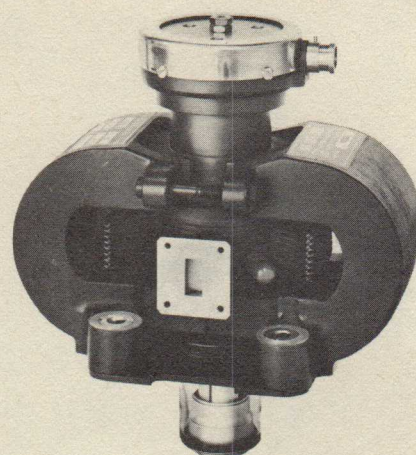
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
X L-4497	4	9375±30	Fixed	6.3	0.6	5.2	3.0	.001	2¼	Weather radar systems, airborne search radar systems and in military and commercial marine radar systems.
X 2J42	7	9375±30	Fixed	6.3	0.5	5.5	4.5	.0025	3	
X 2J42H	7	9375±30	Fixed	6.3	0.5	5.5	4.5	.002	3	
X L-4495	8	9375±30	Fixed	6.3	0.6	5.5	4.5	.0025	3	
X L-4242	15	9375±30	Fixed	6.3	0.5	7.2	7.5	.0025	5	
X 6027	18	9375±30	Fixed	6.3	0.5	7.0	3.5	.0025	5	
X 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.
X L-3431A	18	9375±30	Fixed	6.3	1.2	7.0	7.0	.001	3¾	
X L-3654A	24	9375±30	Fixed	6.3	1.2	8.0	8.25	.001	3¾	
X L-3890A	24	9375±30	Fixed	6.3	1.2	8.0	8.25	.001	3¾	
X 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	
X L-3036A	65	9410±5	Fixed	12.6	2.3	15.0	15.0	.001	6	
X L-3036B	65	9275±15	Fixed	12.6	2.3	15.0	15.0	.001	6	
X L-3036F	65	9245±30	Fixed	12.6	2.3	15.0	15.0	.001	6	
X 4J52A	70	9375±30	Fixed	12.6	2.3	15.0	15.0	.001	6	
X L-3219	70	9400±30	Fixed	12.6	2.3	15.0	15.0	.001	6	
X 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. The L-3613 is a high pulling version designed for frequency modulation and diversity applications.
X 4J50A	225	9375±30	Fixed	13.75	3.35	21.5	27.5	.001	10	
X L-3039D	225	8800±20	Fixed	13.75	3.35	21.5	27.5	.001	10	
L-3039E	225	8860±20	Fixed	13.75	3.35	21.5	27.5	.001	10	
L-3039F	225	8920±20	Fixed	13.75	3.35	21.5	27.5	.001	10	
L-3039G	225	8980±20	Fixed	13.75	3.35	21.5	27.5	.001	10	
L-3039H	225	9040±20	Fixed	13.75	3.35	21.5	27.5	.001	10	
L-3039I	225	9100±20	Fixed	13.75	3.35	21.5	27.5	.001	10	
L-3039J	225	9160±20	Fixed	13.75	3.35	21.5	27.5	.001	10	
L-3039K	225	9220±20	Fixed	13.75	3.35	21.5	27.5	.001	10	
L-3039L	225	9280±20	Fixed	13.75	3.35	21.5	27.5	.001	10	
L-3039M	225	9340±20	Fixed	13.75	3.35	21.5	27.5	.001	10	
L-3039N	225	9400±20	Fixed	13.75	3.35	21.5	27.5	.001	10	
L-3039P	225	9375±30	Fixed	13.75	3.35	21.5	27.5	.001	10	
L-3039R	225	8790±90	Fixed	13.75	3.35	21.5	27.5	.001	10	
L-3613	225	9375±30	Fixed	13.75	3.35	21.5	27.5	.001	10	



L-4316 4" High



L-5049 6" High



7208B 7 7/8" High

# Pulse Magnetrons

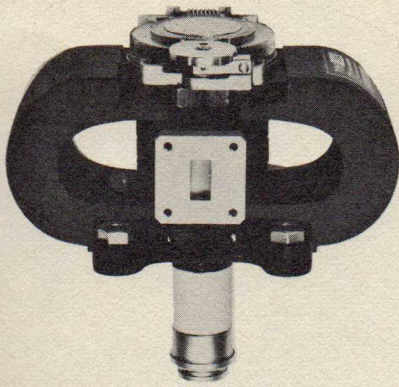
## X-BAND

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-3030	300	9375 ± 30	Fixed	13.75	3.35	27.5	27.5	.001	14	High power versions of 4J50, these tubes are designed for component testing and are not recommended for system applications.
✓ L-3030B	300	9000 ± 30	Fixed	13.75	3.35	27.5	27.5	.001	14	
✓ L-3030C	300	9200 ± 30	Fixed	13.75	3.35	27.5	27.5	.001	14	
✓ L-3030D	330	9375 ± 30	Fixed	13.75	3.37	26.29	27.5	.001	14	
✓ 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, X-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.
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	
✓ L-4264	20	9600-10,000	Mechanical	6.3	2.4	7.8	8.0	.0015	5	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.
✓ L-4193C	90	8500-9600	Mechanical	13.75	3.2	21	13	.0025	11	
7006	190	9000-9600	Mechanical	13.75	3.2	21.5	27.5	.0013	11	
✓ L-4193/7008	200	8500-9600	Mechanical	13.75	3.2	21.5	27.5	.0013	11	
✓ M-4193B/7692	200	9200-9550	Mechanical	13.75	3.2	21.5	27.5	.0013	11	
7111	200	8500-9600	Mechanical	13.75	3.2	21.5	27.5	.0013	10	
✓ L-4490	200	8500-9600	Mechanical	13.75	3.15	21.5	27.5	.0013	10	
✓ L-4502*	200	8700-9400	Mechanical	13.75	3.15	21.0	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	

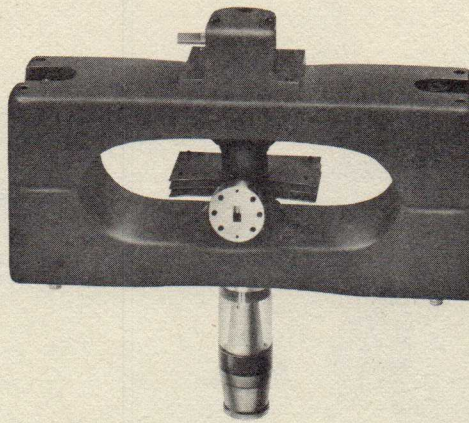
\*Temperature Compensated

## Ku-BAND COAXIAL

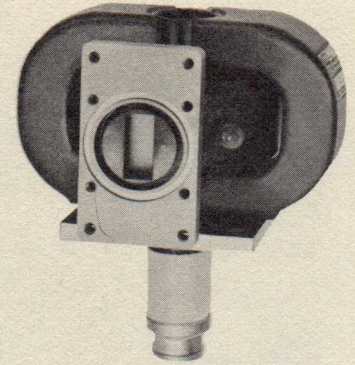
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
✓ L-3950	60	16,500 ± 100	Fixed	12.6	2.5	16	16	.001	6	Applications include weather, fire control, terrain following and navigation radar systems.
✓ L-3976	100	16,500 ± 150	Fixed	12.6	2.5	16	16	.001	6	



L-5115 5 1/2" High



L-4516 6 1/16" High



L-5365 5 1/2" High

# Pulse Magnetrons

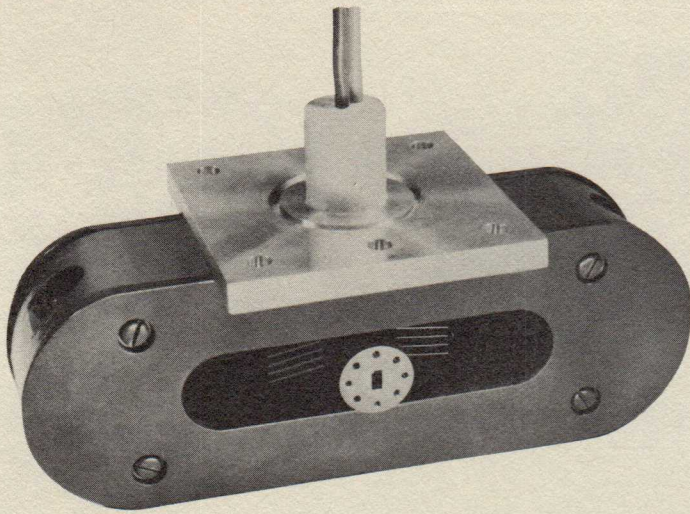
## Ku-BAND COAXIAL

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			
X L-4419	65	16,500 <sup>+125</sup> <sub>-90</sub>	Fixed	12.6	2.6	15	16	.001	5	This magnetron features a special cathode design providing exceptional life and reliability for airborne systems.
X 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.
X L-4362/ 8468	60	16,000-17,000	Servo-tunable	12.6	2.6	16	16	.001	8	For multi-purpose airborne systems. The L-4472 is designed for exceptionally low jitter.
X L-4472 7208	65 100	16,000-17,000 15,800-17,200	Servo-tunable Servo-tunable	12.6 12.6	2.6 3.5	16 18	16 17	.001 .001	6 1/2 14	
X 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.
X L-5265	24.0	16,500-17,000	Mechanical	12.6	1.7	13.0	9.0	.001	9.0	Specially designed to operate at extremely short pulse widths of 100 nanoseconds and below with low jitter and high repetition rates. Suitable for both airborne and ground based environments.
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	
7208B	125	15,500-17,500	Servo-tunable	12.6	2.5	18	19	.001	14	

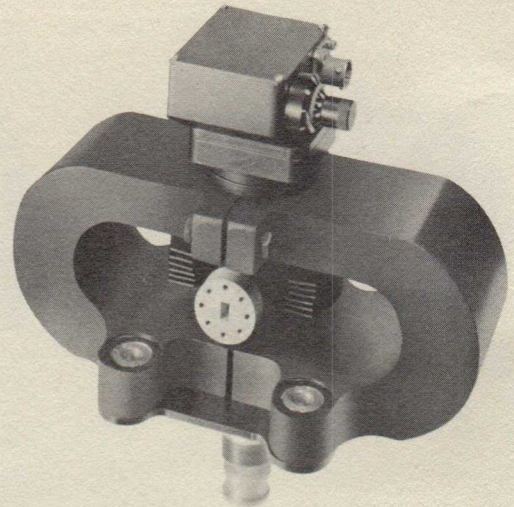
\*Outline same as L-5049

## Ku-BAND

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			
X 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.
X L-3101A	60	16,000-17,000	Mechanical	12.6	2.4	17.0	16.0	.001	5 3/4	
X L-3978	70	16,000-16,500	Mechanical	12.6	2.4	17.0	16.0	.001	5 3/4	



L-4296 4 7/8" High



L-4555 7 3/4" High

# Pulse Magnetrons

## K-BAND

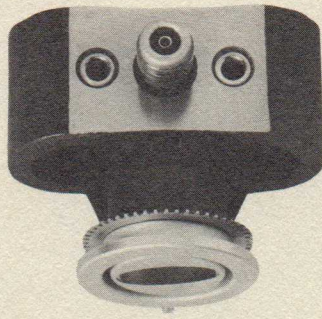
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
X L-4316	25	24,000 +300 -200	Fixed	6.3	2.5	13.6	12.5	.0007	4	Specially designed cathode to meet highly exacting shock and vibration conditions. Ideally suited for surveillance and missile applications.
X L-4154/ 7449A	65	24,000 ± 100	Fixed	5.0	3.1	14	25	.001	7.3	

## Ka-BAND COAXIAL

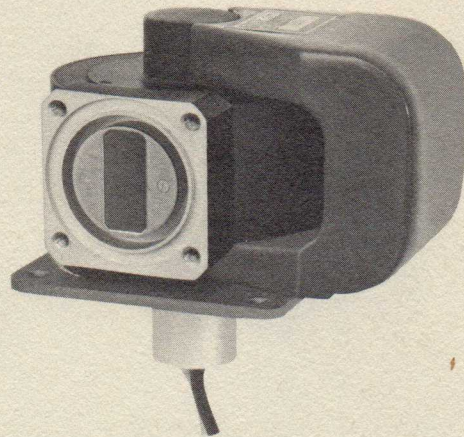
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
X L-4555	65.0	32,100-33,100	Mechanical	6.3	3.5	16.0	16.0	.001	10.0	For use in precision, forward looking, airborne radar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

## Ka BAND

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			
X L-4485	2.0	33,070-33,220	Mechanical	6.3	0.45	7.0	1.5	.0004	2	Used in automatic landing systems, reconnaissance and mapping radar systems, side looking radar systems and portable, field type radar systems.
7619	40	34,860 ± 348	Fixed	12.6	2.8	11.5	20	.001	9	
X L-4296/ 8366	50	33,200 ± 200	Fixed	12.6	2.8	12	25	.001	10 1/2	
X L-4064A	125	34,850 ± 150	Fixed	6.3	3.5	19	27	.001	9	
X 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.
X L-4516	100	34,700-34,930	Mechanical	6.3	3.5	17-21	27	.001	9 1/2	
X L-4306	110	34,700-35,000	Mechanical	6.3	3.5	19	27	.001	9	



L-3225 2 $\frac{5}{8}$ " High



L-5274 3 $\frac{1}{2}$ " High

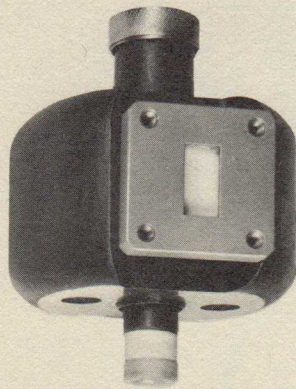
## Miniature Pulse Magnetrons

### X-BAND COAXIAL

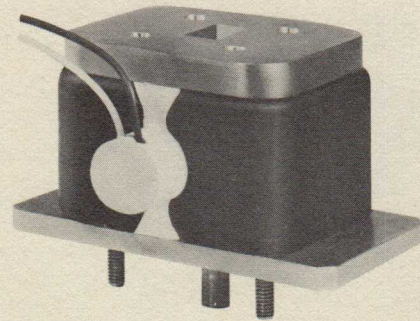
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
X L-5274	7.5	9345 $\pm$ 20	Fixed	6.3	1.65	4.3	4.5	.0013	2.5	Specifically designed for new generation lightweight, airborne weather radar systems.
X L-5362	10.0	9345 $\pm$ 20	Fixed	6.3	1.6	5.0	5.0	.0005	2.5	
X L-5359	7.0	9375 $\pm$ 5	Fixed	6.3	1.6	4.4	4.5	.0013	3.0	Specially suited for applications requiring low frequency drift. This tube features narrow range frequency adjustment in addition to a temperature coefficient of 50 KHz/ $^{\circ}$ C.

### X-BAND

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			
X L-3089B	0.04	8800 $\pm$ 25	Fixed	6.3	0.90	0.85	0.20	.25	1.25	Designed for pulse doppler and beacon applications where extremely high duty is essential; available with 1000 or 2000 hour warranty.
X L-3105	0.10	9300 $\pm$ 40	Fixed	6.3	0.50	0.8	0.55	.027	1.4	For high performance aircraft, missile and satellite systems. Low temperature coefficient (less than 75 KHz/ $^{\circ}$ C), high frequency stability and short pulse operation (.020 $\mu$ sec and less).
X L-3956	4.5	8900 $\pm$ 20	Fixed	6.3	0.90	3.8	3.75	.0012	1.4	
X L-3813	0.5	9300 $\pm$ 30	Fixed	6.3	0.90	1.3	1.30	.01	1.0	Packaged in a 2" cube permanent magnet; designed for beacons, IFF, interrogators and portable radars.
X L-3798	0.30	8520-8550	Mechanical	6.3	0.50	.55	0.30	.001	1.0	Designed for beacon and transponder applications these tubes provide stable operation with coded pulse groups.
X L-3028D	0.12	9280-9330	Mechanical	6.3	0.50	.80	0.55	.027	1.0	
X L-5104	0.12	9290-9310	Mechanical	6.3	0.50	.80	0.55	.027	1.0	
X L-3601	0.12	9315-9340	Mechanical	6.3	0.50	.80	0.55	.027	1.0	
X L-3225	1.0	9310-9350	Mechanical	6.3	0.50	2.8	1.33	.003	1.0	
X L-5145	1.0	9275-9295	Mechanical	6.3	0.50	2.8	1.33	.003	1.0	



L-5048 2 $\frac{7}{16}$ " High



L-4370 2 $\frac{3}{8}$ " High

# Miniature Pulse Magnetrons

## X-BAND

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			
7503	0.1	9300-9500	Mechanical	5.0	0.6	1.45	0.95	.002	0.37	
X L-3379	1.0	8800-9500	Mechanical	6.3	0.90	3.35	1.15	.003	1.4	For beacons, transponders, and small radar systems. Feature quick warm-up, extremely short pulse operation and stable frequency operation.
X L-3380	2.0	8800-9500	Mechanical	6.3	0.90	3.45	2.25	.002	1.4	
X L-3381	3.0	8800-9500	Mechanical	6.3	0.90	3.60	3.25	.001	1.4	
X L-3382	4.0	8800-9500	Mechanical	6.3	0.90	4.00	4.00	.001	1.4	

## Ke-BAND

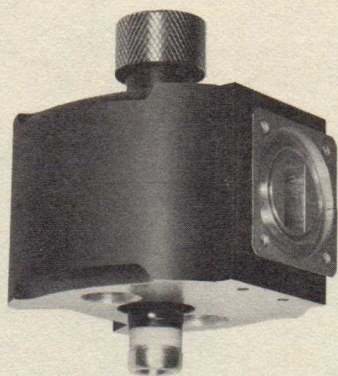
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
X L-4370	0.04	13,325±30	Fixed	6.3	1.0	.80	0.24	.25	1.56	For doppler navigation systems.

## Ku-BAND COAXIAL

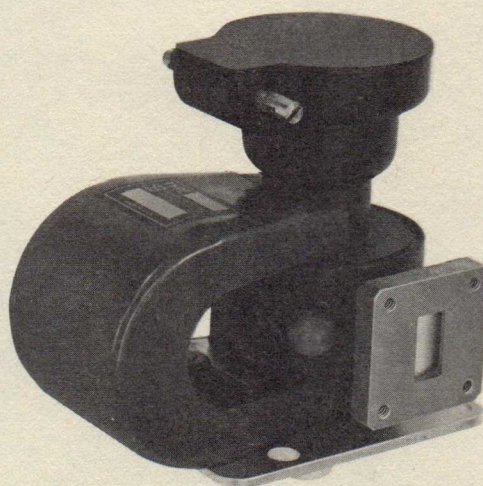
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
X L-3958	9.0	15,500±85	Fixed	6.3	1.6	5.0	5.0	.003	2.5	Applications include weather, fire control, terrain following and navigation radar systems.
X 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.										
X 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.
X L-5383A*	0.2	16,200-16,300	Mechanical	4.75	0.6	1.9	.75	.0021	2.0	
X L-5271	0.8	16,200-16,300	Mechanical	4.75	0.6	2.8	.75	.0005	2.0	
X L-5048**	1.0	15,950-16,550	Mechanical	4.75	0.6	3.05	1.6	.001	1.25	
	1.9	15,950-16,550	Mechanical	4.75	0.6	3.10	2.5	.001	1.25	
X L-5113	2.2	15,400-15,700	Mechanical	6.3	0.95	3.55	3.1	.001	1.5	
X L-5013	4.0	15,500-16,500	Mechanical	6.3	1.6	4.50	3.5	.001	3	
X L-5035	8.0	15,900-16,400	Mechanical	6.3	1.6	5.00	6.0	.003	3	

\* Same electrical performance as L-5383, but capable of withstanding 200G shock

\*\* Tested at two drive levels.



L-3496A 3 $\frac{7}{16}$ " High



L-5328 4 $\frac{3}{16}$ " High

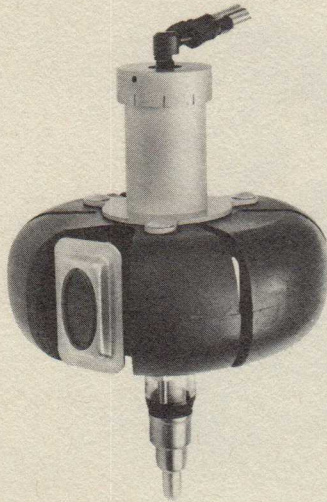
## Miniature Pulse Magnetrons

### Ku-BAND COAXIAL

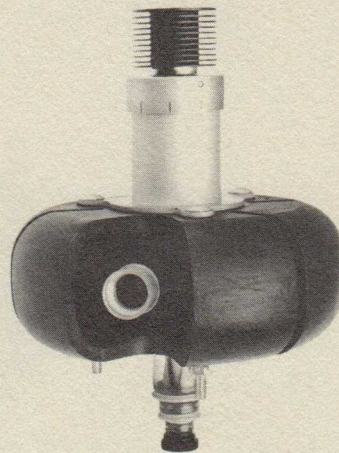
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
X L-5328	2.5	15,400-15,700	Mechanical	6.3	2.0	3.6	3.0	.005	3.0	Capable of wide duty cycle range without heater programming. Has low temperature coefficient.

### Ku-BAND

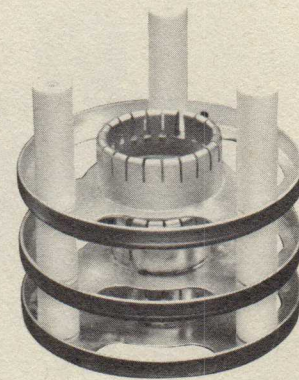
Tube Type	Min. Peak Power (kw)	Frequency (MHz)	Tuning	Nominal Operating Characteristics				Max. Duty	Max. Wt. (lbs.)	Applications/Comments
				Ef Volts	If Amps	eb kilovolts	ib amps			
X L-3645	4.0	16,200±100	Fixed	6.3	0.95	4.0	3.75	.001	1.25	May be pulsed with high duty coded pulse groups or with single short pulses. Low temperature coefficient and stable frequency operation provide high performance for airborne applications.
X L-3496A	1.0	16,000-16,500	Mechanical	4.7	0.70	3.0	1.60	.003	1.2	For use in lightweight systems where low filament power is important.
Y L-5189	1.0	14,200±150	Fixed	6.3	0.7	2.2	1.6	.001	1.5	Pulsed anode magnetron suitable for nanosecond pulse widths.
X L-3915	2.2	16,260-16,300	Mechanical	6.3	0.90	3.6	2.75	.003	1.5	For use in high performance aircraft and missile applications. Encapsulated leads permit high altitude use without pressurization.



L-3461 11 1/2" High



L-3502 10 3/8" High



SOCKET

# CW/Pulse Magnetrons and Accessories

## CW/PULSE MAGNETRONS

Tube Type	Tunable Frequency (MHz)	Min. CW Power (W)	Nominal CW Characteristics Eb (kv) Ib (ma)	Min. Pulse Power (kw)	Nominal Pulse Characteristics eb (kv) ib (a)	Cooling	Max. Height (in.)	Max. Weight (lbs.)	Applications/Comments
X L-3456	350-590	200	4.0 200	—	—	Liquid	10 1/2	18	Two families of Litton Industries' CW/Pulse Magnetrons, intended for CW, modulated CW, or high duty pulse operation, provide power from 110 to 500 watts average and 800 watts 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.
X L-3714	475-725	175	3.0 200	—	—	Liquid	10 1/2	18	
X L-3459	590-975	200	4.0 200	—	—	Liquid	10 1/2	18	
X L-3465/A	975-1500	400	4.0 300	1.5	4.6 0.8	Liquid	10 1/2	18	
X L-3464/A	1500-2350	400	4.0 325	1.2	5.0 0.8	Liquid	10 1/2	18	
X L-3460/A	2350-3575	500	4.0 300	1.8	4.7 0.8	Liquid	10 1/2	18	
X L-3461/A	3575-4975	350	4.0 250	1.5	4.7 0.8	Liquid	10 1/2	18	
X L-3467/A	4975-6175	400	4.2 250	1.5	4.9 0.8	Liquid	10 1/2	18	
X L-3468/A	6175-7275	300	4.2 200	1.5	4.7 0.8	Liquid	10 1/2	18	
X L-3462/A	7275-8775	300	4.3 250	1.5	5.0 0.8	Liquid	10 1/2	18	
X L-3463/A	8775-10,475	250	4.3 200	1.2	5.2 0.6	Liquid	10 1/2	18	
X L-3500	350-590	100	3.1 130	—	—	Forced Air	11 1/2	18	
X L-3501	590-975	100	3.1 130	—	—	Forced Air	11 1/2	18	
X L-3502/A	975-1500	110	3.1 130	0.8	3.8 0.6	Forced Air	11 1/2	18	
X L-3503/A	1500-2350	110	3.1 130	0.8	4.1 0.6	Forced Air	11 1/2	18	
X L-3504/A	2350-3575	110	3.1 130	0.8	3.8 0.6	Forced Air	11 1/2	18	
X L-3505/A	3575-4975	110	3.1 130	0.8	3.8 0.6	Forced Air	11 1/2	18	
X L-3506/A	4975-6175	110	3.1 130	0.8	3.8 0.6	Forced Air	11 1/2	18	
X L-3507/A	6175-7275	110	3.1 130	0.8	3.7 0.6	Forced Air	11 1/2	18	
X L-3508/A	7275-8775	110	3.1 130	0.8	3.8 0.6	Forced Air	11 1/2	18	
X L-3509/A	8775-10,475	110	3.1 130	0.8	4.3 0.6	Forced Air	11 1/2	18	

## BARRATRON® TRANSMITTING TUBES

The BARRATRON® transmitting tube, a Litton Industries development, is an efficient generator of high power white noise in the microwave bands. BARRATRON® tubes have been produced that operate in UHF through X-band with quantity productions in P, L and S-bands. Some tubes are equipped with tuners, permitting more general application. Where size, weight and simplicity are vital, there are fixed frequency tubes designed for more specific applications.

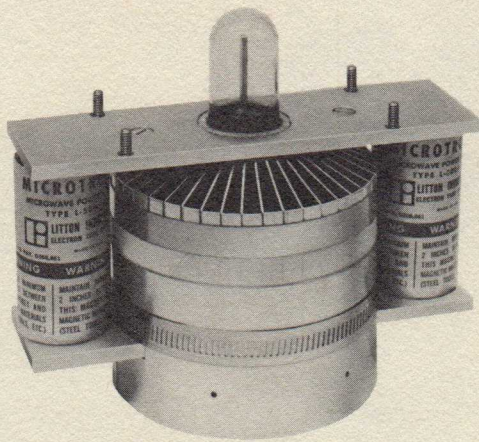
Originally, BARRATRON® tubes were utilized for the non-coherent white

noise capability. The effectiveness of these tubes is the result of the high quality of the white noise spread across a wide band.

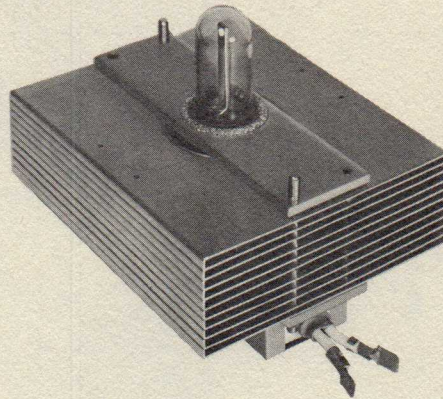
More recently, it has been discovered that with minor redesign, external modulation can be added, increasing the rf bandwidth and total power output while maintaining and even improving its effectiveness as an electronic countermeasures power source.

Details are classified and made available on a "need-to-know" basis.

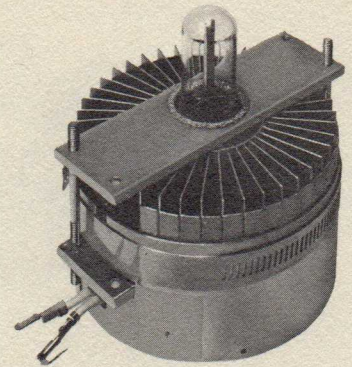




L-5001 7 $\frac{1}{16}$ " Wide



L-5260A 5" Wide



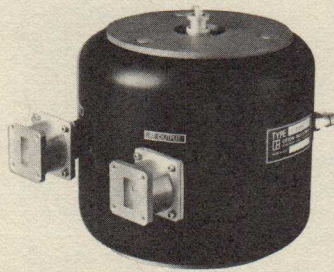
L-5261A 4 $\frac{7}{8}$ " Wide

# CW Magnetrons

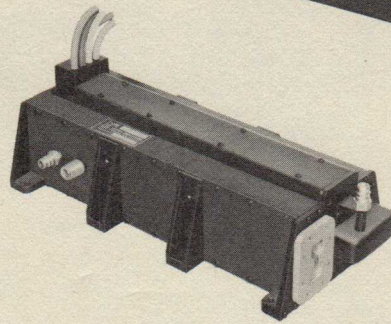
## MICROTRON® POWER TUBES

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
X L-3858	2650	2000	7.2	560	130	67	Liquid	Electromagnet	Industrial	
X L-3189	1350	927	7.0	300	80	70	Liquid	Electromagnet	Commercial	
X L-5001	950-1700	650-1200	3.55	400-725	92	68	Forced Air	Permanent	Commercial	
# L-5260A	960	750	3.55	400	73	67	Forced Air	Permanent	Domestic	
# L-5261A	840	625	3.5	360	73	67	Forced Air	Permanent	Domestic	

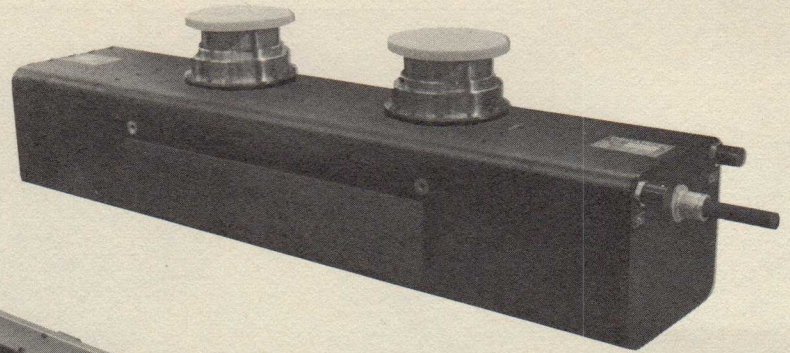
Litton Industries Electron Tube Division offers a variety of CW magnetrons for microwave heating and cooking applications. All tubes operate within the 2450 MHz ISM band and are waveguide coupled. The L-5260A and L-5261A are equipped with an integral RFI filter box, are designed for operation with half-wave doubler rectification, and 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-5334 6 $\frac{3}{4}$ " High



C-Band Injected Beam CFA 13" Long



L-5373 37 $\frac{1}{2}$ " Long

# Crossed Field Amplifiers

## DISTRIBUTED EMISSION CROSSED FIELD AMPLIFIERS

These forward wave, cold cathode, crossed field amplifiers provide high peak power, pulsed amplification, and are ideal for upgrading the power levels and operating capabilities of simple or complex radar systems. They are particularly well suited to new generation, sophisticated radar systems requiring a high order of phase linearity and stability. Two basic types have been developed; the DEMATRON, and the reentrant beam CFA (RBCFA).

The DEMATRON is a linear format, non-reentrant beam amplifier which is completely self-modulating; that is, dc current is drawn only with the application of the rf drive signal. This permits operation of the tube under conditions of variable pulse lengths and variable pulse repetition rates, as well as for burst mode operations without a pulse modulator or trigger-off

pulse. The DEMATRON crossed field amplifier operates directly from a dc power supply.

The reentrant beam crossed field amplifier is a circular format tube which is specifically designed for cathode modulation. When simple modulation systems are required, the higher gain and higher efficiency of the RBCFA may make it more attractive than the non-reentrant, linear format DEMATRON.

Both classes of tubes have the same outstanding phase characteristics, long life, and secondary emitting cold cathodes. Since development has been completed for a wide range of tubes, it is possible to scale to new frequencies and/or power levels with modest engineering effort.

Tube Type	Frequency Band	Bandwidth (MHz)	Peak Power Output (kw)	Duty	Gain (dB)	Tube Class
L-5373	S	300	500	.01	13	DEMATRON
L-5332	S	500	500	.005	16	RBCFA
L-5408	C	400	500	.002	13	DEMATRON
L-5371	X	600	50-80	.001	13	DEMATRON
L-5372	X	600	500	.001	13	DEMATRON
L-5334	X	1000	500	.001	18	RBCFA

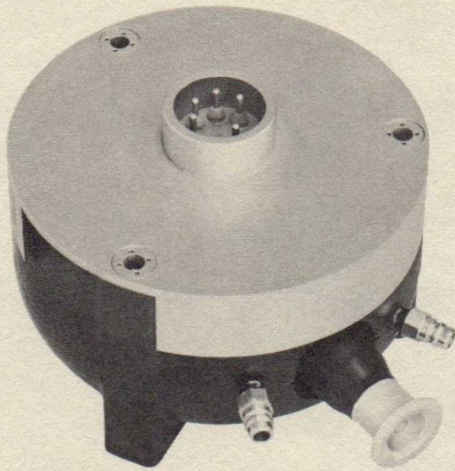
## INJECTED BEAM CROSSED FIELD AMPLIFIERS

Injected beam crossed field amplifiers offer the advantages of high average power, good efficiency, low perveance, wide bandwidths, dual mode operation, and multiple signal amplification. These tubes are ideal for applications where high duty pulse and/or high CW power are required.

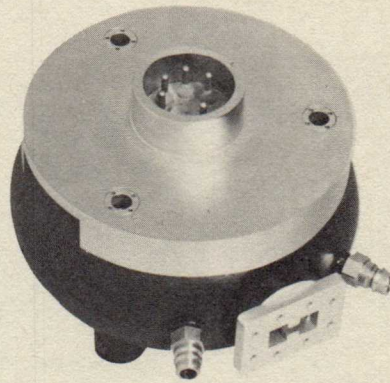
Two classes of tubes have been developed. The S- and C-band tubes

shown use helix derived circuits and are, therefore, broadband devices, but are limited in average power. The X-band and Ku-band tubes listed here use all metal circuits operated in a forward wave mode. These circuits limit the useful bandwidth, but are thermally rugged; an important characteristic for high power tubes.

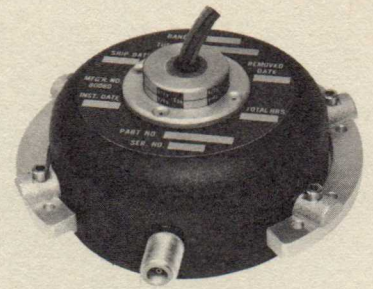
	Frequency Band	Bandwidth (MHz)	CW Power Output (W)	Pulse Power Output (kw)	Gain (dB)
Representative Capability	S	1200	750	1.2	13
	C	2000	500	1.0	13
	X	1800	1000	2.0	20
	Ku	2000	400	0.8	20



L-3721 7 $\frac{5}{8}$ " Wide



L-3726 6 $\frac{5}{8}$ " Wide



L-5317 6 $\frac{1}{4}$ " 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  $\frac{7}{8}$  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.

## PLANAR TRIODES

Tube Type	Max. Frequency (GHz)	Function	Power Output	Remarks.	Applications/Comments
2C36	4.0	CW & plate-pulsed oscillator	1.0 w, CW 1000 w, 1000 pps	With internal feedback loop.	
2C37	3.3	CW oscillator or amplifier	600 mw - 2.0 w, CW	2C36 without feedback loop.	Litton Industries at its Williamsport facility manufactures planar tubes for both pulsed and CW service at frequencies up to 5.75 gigahertz. Planar triodes are used in most types of microwave communications equipment - navigation, identification and radar equipment - ground, sea and airborne.
5767	3.3	CW oscillator	200 mw - 2.0 w	Folded discs for lumped-constant or butterfly circuits. Low anode-to-cathode capacitance.	
5768	3.0	CW amplifier		16 db gain - 9 db noise. Double-ended.	
6481	3.3	CW oscillator	300 mw - 2.0 w	Folded discs for lumped-constant or butterfly circuits.	
6503	5.75	CW & plate-pulsed oscillator	25 mw, CW 1000 w, 1000 pps	Extremely stable prime signal source.	

## SALES OFFICES

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

Applications engineering specialists are available

**EAST**  
265 Monmouth Park Highway  
West Long Branch, New Jersey 07764  
(201) 542-7101

**DISTRICT OF COLUMBIA**  
1875 Connecticut Avenue, NW  
Suite 1013, Universal Bldg. North  
Washington, D.C. 20009  
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Warner Robins, Georgia 31093  
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Fairborn, Ohio 45324  
(513) 878-6122

**SOUTHWEST**  
11333 North Central Expressway  
Suite 211  
Dallas, Texas 75231  
(214) 369-2184

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

for consultation at San Carlos, and at our Williamsport Facility, 1035 Westminster Drive, Williamsport, Pa. 17701. Phone: (717) 326-3561. Telex 84-1430.

Electron Tube Sales Offices are listed below:

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

### LITTON PRECISION PRODUCTS INTERNATIONAL

120 Avenue des Champs Elysees  
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I 20121 Milan, Italy

95 High Street  
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England

Sköldungagatan 4  
Fack  
S-100 41 Stockholm 26, Sweden

Steenloperstraat 26  
Capelle a/d IJssel  
Holland

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8050 Zurich, Switzerland

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

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

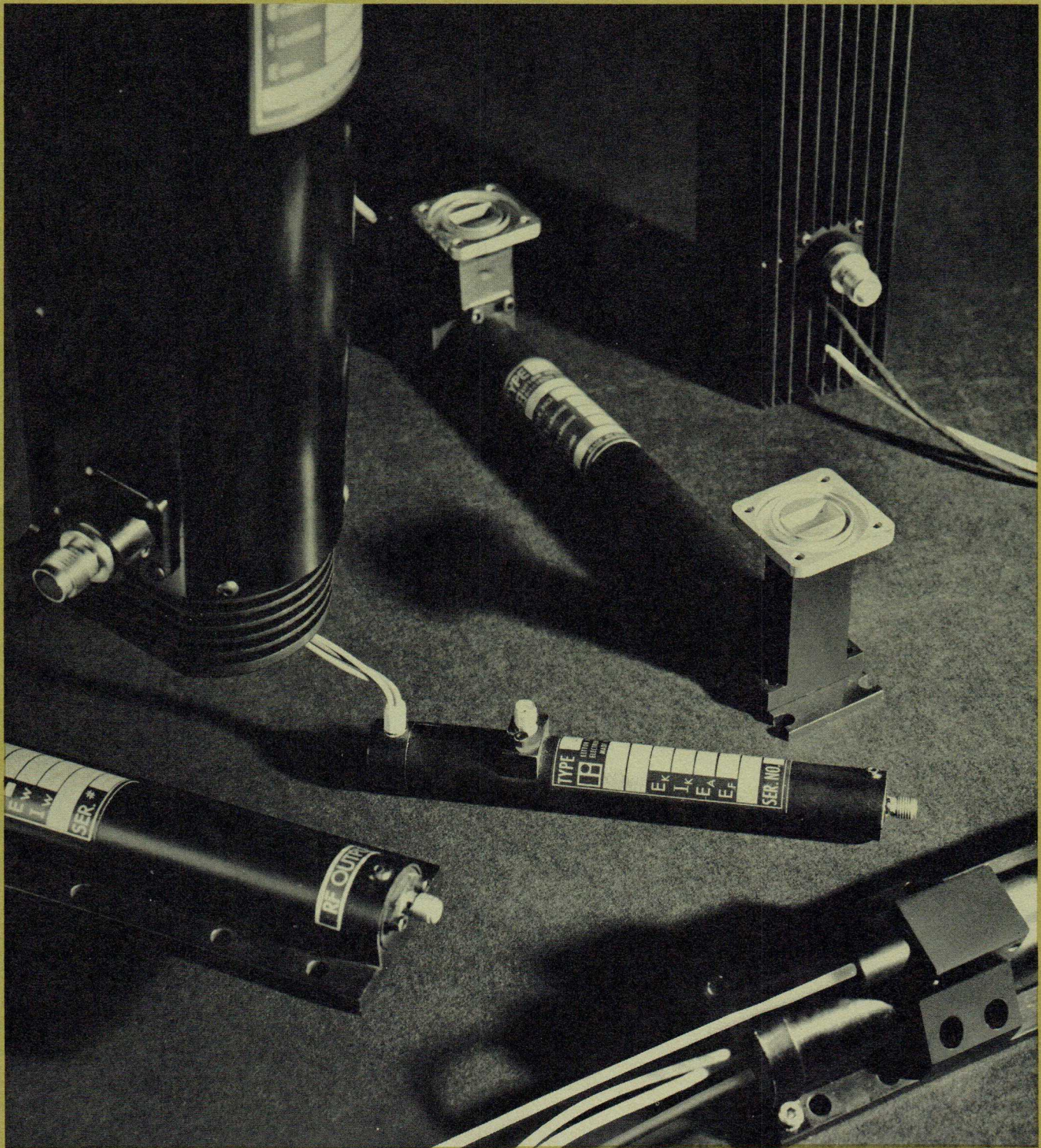
M.T.I. ENGINEERING, LTD.  
182 Ben Yehuda Street  
Tel-Aviv, Israel



**ELECTRON TUBE DIVISION**  
San Carlos, California • Williamsport, Pennsylvania



# Traveling Wave Tube Product Summary





L-5014 6 1/2" Long



L-3928 11 1/2" Long



L-5280 12" Long



L-5263 15 1/2" Long

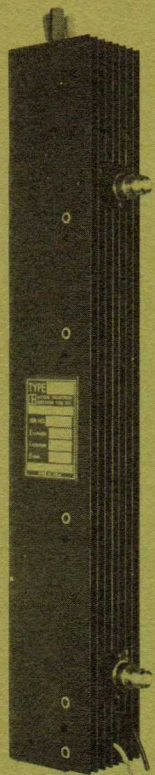
### LOW POWER TWT's — CW

Tube Type	Frequency Range (MHz)	Minimum Power Output (mW)	Minimum Small Signal Gain (db)	Weight (lbs.)	Cooling	Applications/Comments
X L-5014	2000-4000	10	13	0.5	None	These lightweight, compact TWT's will operate either CW, or pulsed at extremely low voltages. Applications include telemetry, ECM, data links and intermediate amplifiers.
X L-5015	4000-8000	10	13	0.5	None	
X L-5218	4000-8000	40	33	1.5	None	
X L-5023	7000-11,000	20	30	0.5	None	

### MEDIUM POWER TWT's — CW

Tube Type	Frequency Range (MHz)	Minimum Power Output (W)	Minimum Small Signal Gain (db)	Weight (lbs.)	Cooling	Applications/Comments
X L-3845	1000-2000	1.0	30	2.0	Conduction	In addition to usage as conventional intermediate amplifiers, TWT's in this category find particular application in ECM and target augmentation systems.
X L-5036	1000-2000	10	30	3.0	Conduction and Forced Air	
X L-5155	1000-2000	20	30	3.5	Conduction and Forced Air	
X L-5225	1700-2700	10	30	3.5	Conduction and Forced Air	
X L-5007	2000-4000	2.0	36	1.5	Conduction	
X L-5010	2000-4000	10	33	2.5	Conduction and Forced Air	
X L-5160	2000-4000	20	33	3.0	Conduction and Forced Air	
X L-3971*	2400-3600	1.0	50	1.5	Conduction	
X L-5121*	2600-5300	2.0	60	1.5	Conduction	
X L-5134	3700-6500	10	36	2.5	Conduction and Forced Air	
X L-5009	4000-8000	2.0	50	1.5	Conduction	
X L-5011	4000-8000	10	33	2.5	Conduction and Forced Air	
X L-5083	4000-8000	20	33	3.5	Conduction and Forced Air	

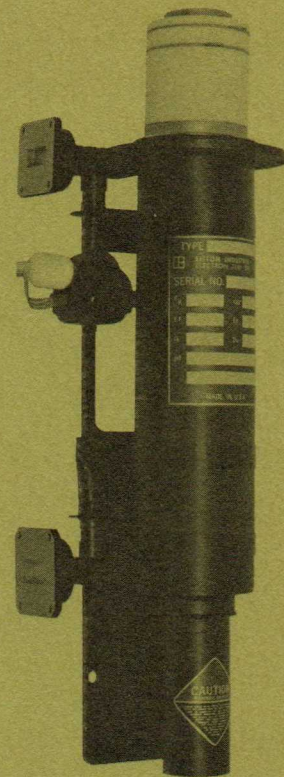
\*High  $\mu$  Grid



L-5126 15.8" Long



L-5117 11 $\frac{7}{16}$ " Long



L-5253 17" Long

### MEDIUM POWER TWT's - CW (cont'd)

Tube Type	Frequency Range (MHz)	Minimum Power Output (W)	Minimum Small Signal Gain (db)	Weight (lbs.)	Cooling	Applications/Comments
L-3996	4000-8000	1.0	50	1.5	Conduction	
L-3957	5400-11,000	2.0	60	1.5	Conduction	
L-5154	7900-8400	5.0	55	3.2	Conduction	
L-5380	7900-8400	15	48	3.0	Conduction and Forced Air	
L-5045	7000-11,000	1.0	30	1.5	Conduction	
L-3998	7000-11,000	2.0	36	1.5	Conduction	
L-3928	7000-11,000	10	40	2.5	Conduction and Forced Air	In addition to usage as conventional intermediate amplifiers, TWT's in this category find particular application in ECM and target augmentation systems.
L-5043	7000-11,000	10	60	2.5	Conduction and Forced Air	
L-5275	7000-11,000	20	40	4.0	Conduction and Forced Air	
L-3972	8200-10,000	1.0	60	1.5	Conduction	
L-5293	7000-12,000	10	40	2.0	Conduction and Forced Air	
L-5008	8000-12,000	2.0	36	1.5	Conduction	
L-5339	8000-14,000	1.0	35	1.2	Conduction	
L-5322	8000-14,000	2.0	65	1.5	Conduction	
L-5227	12,400-18,000	2.0	35	2.0	Conduction and Forced Air	

### HIGH POWER TWT's - CW

Tube Type	Frequency Range (MHz)	Minimum Power Output (W)	Minimum Small Signal Gain (db)	Weight (lbs.)	Cooling	Applications/Comments
L-5281	2000-4000	250	40	10.0	Conduction	These tubes, distinguished by their octave bandwidths and high gain, are built for rugged environments such as MIL-E-5400, Class II airborne. Applications include communications and ECM.
L-5323	2600-5200	200	40	10.0	Conduction	
L-5324	5000-10,000	200	40	7.0	Conduction	
L-5280	7000-11,000	200	40	8.0	Conduction	

## HIGH POWER TWT's — PULSED

Tube Type	Frequency Range (MHz)	Minimum Power Output (W)	Minimum Small Signal Gain (db)	Maximum Duty	Cooling	Applications/Comments
X L-5095	2000-4000	50	45	0.1	Conduction or Forced Air	High power, pulsed traveling wave tubes are available from 50 watts to 1 kilowatt in frequency ranges from 2000 MHz to 12,000 MHz. These TWT's feature wide bandwidths, in addition to reduced size and weight.
X L-5336	2000-4000	1000	35	0.02	Conduction and Forced Air	
L-5283	2000-4000	1000	55	0.02	Conduction and Forced Air	
X L-5366	3000-3500	3000	60	0.04	Conduction and Forced Air	
X L-5321	2650-5300	1000	36	0.02	Conduction and Forced Air	
X L-5320	2650-5300	1000	50	0.02	Conduction and Forced Air	
X L-5263	4000-8000	1000	35	0.02	Conduction and Forced Air	
X L-5089	7000-11,000	1000	35	0.01	Conduction or Forced Air	
X L-5126	7000-11,000	1000	60	0.01	Conduction or Forced Air	
X L-5117	12,400-18,000	3	60	0.20	Conduction	

## COUPLED CAVITY TWT's — PULSED

Tube Type	Frequency Range (MHz)	Minimum Power Output (kW)	Minimum Small Signal Gain (db)	Maximum Duty	Cooling	Applications/Comments
X L-5252	8900-9500	12	40	0.005	Conduction; 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.
X L-5250	9200-9700	25	50	0.01	Forced Air	
X L-5255	9300-9900	25	48	0.01	Forced Air; gridded	
X L-5253	9400-10,100	40	46	0.002	Conduction	

## 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. Electron Tube Sales Offices are listed below:

<b>EAST</b> 265 Monmouth Park Highway West Long Branch, New Jersey 07764 (201) 542-7101	<b>SOUTH</b> P. O. Box 00 Warner Robins, Georgia 31093 (912) 923-3397	<b>SOUTHWEST</b> 11333 North Central Expressway Suite 211 Dallas, Texas 75231 (214) 369-2184
<b>DISTRICT OF COLUMBIA</b> 1875 Connecticut Avenue, NW Suite 1013, Universal Bldg. North Washington, D.C. 20009 (202) 462-8833	<b>MIDWEST</b> 55 North Central Avenue Fairborn, Ohio 45324 (513) 878-6122	<b>WEST</b> 960 Industrial Road San Carlos, California 94070 (415) 591-8411

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Newtonstrasse 13 8 Munich 80, West Germany	Sködingagatan 4 Fack S-100 41 Stockholm 26, Sweden	Gubelstrasse 28 8050 Zurich, Switzerland
Via Arco 4 I 20121 Milan, Italy		
<b>DENLEN CORPORATION, LTD.</b> 23 Guardsman Road Thornhill, Ontario, Canada (416) 889-7201	<b>WESTREX COMPANY, ORIENT</b> Central P. O. Box 760 Tokyo, Japan	<b>M.T.I. ENGINEERING, LTD.</b> 182 Ben Yehuda Street Tel-Aviv, Israel



LITTON INDUSTRIES ELECTRON TUBE DIVISION • SAN CARLOS, CALIFORNIA





L-2337 10<sup>3</sup>/<sub>4</sub>" Long



L-2364 12<sup>1</sup>/<sub>2</sub>" Long



L-2785 15" Long

# Low Noise Traveling Wave Tubes & Amplifiers

## LOW NOISE, LOW POWER AMPLIFIERS — CW

Amplifier Type	Tube Type	Frequency (GHz)	CW Power Output (mW)	Gain (dB)	Noise Figure (dB)	Applications/Comments
<del>L-2780</del>	<del>L-2333-06</del>	2.0-4.0	10.0	35	10	These traveling wave tube amplifiers feature solid-state power supplies, and are ruggedized for use in airborne environments. They are designed to withstand temperature variations from -54°C to +120°C. Typical power input is 15 watts, and all units operate from 115 volt AC, single phase 60-400 Hz. These devices are normally used as pre-drivers or receivers in ECM, and radar applications.
<del>L-2787</del>	<del>L-2333-11</del>	2.6-5.2	10.0	35	10	
<del>L-2781</del>	<del>L-2357-03</del>	4.0-8.0	10.0	33	13	
<del>L-2789</del>	<del>L-2357-04</del>	5.0-10.0	10.0	33	14	
<del>L-2782</del>	<del>L-2337-18</del>	7.0-11.0	10.0	33	12	
<del>L-2798</del>	<del>L-2365-01</del>	8.0-16.0	10.0	33	14	
<del>L-2797</del>	<del>L-2365-03</del>	12.0-18.0	10.0	30	15	

## LOW NOISE, MEDIUM POWER AMPLIFIERS — CW

Amplifier Type	Tube Type	Frequency (GHz)	CW Power Output (W)	Gain (dB)	Noise Figure (dB)	Applications/Comments
<del>L-2783</del>	<del>L-2330-13</del>	2.0-4.0	1.0	35	13	Litton low noise, medium power traveling wave tube amplifiers, with solid-state power supplies, have been ruggedized for use in airborne environments. They are designed for temperature extremes from -54°C to +120°C. Typical power input is 45 watts and all units operate from 115 volt AC, single phase 60-400 Hz. These devices are ideally suited for use as drivers in ECM, radar, and communications systems.
<del>L-2786</del>	<del>L-2352-03</del>	2.6-5.2	1.0	35	17	
<del>L-2784</del>	<del>L-2335-17</del>	4.0-8.0	1.0	33	18	
<del>L-2788</del>	<del>L-2335-16</del>	5.0-10.0	1.0	35	17	
<del>L-2785</del>	<del>L-2338-20</del>	7.0-12.4	1.0	35	18	
<del>L-2795</del>	<del>L-2364-01</del>	8.0-16.0	1.0	35	20	
<del>L-2796</del>	<del>L-2364-05</del>	12.0-18.0	1.0	30	22	

# Traveling Wave Tubes

## LOW POWER TWT's — CW

Tube Type	Frequency Range (MHz)	Minimum Power Output (mW)	Minimum Small Signal Gain (dB)	Maximum Noise Figure (dB)	Applications/Comments
L-2333-08	2000-4000	10.0	30	20	These PPM focused TWT's are fully qualified for applications such as airborne ECM receivers and as pre-drivers. They provide extremely flat response with respect to gain/frequency, and all are available with solid-state power supplies.
L-2357-06	4000-8000	10.0	30	20	
L-2337-14	7000-11,000	10.0	30	20	
L-2337-23	7000-12,400	10.0	30	20	

## MEDIUM POWER TWT's — CW

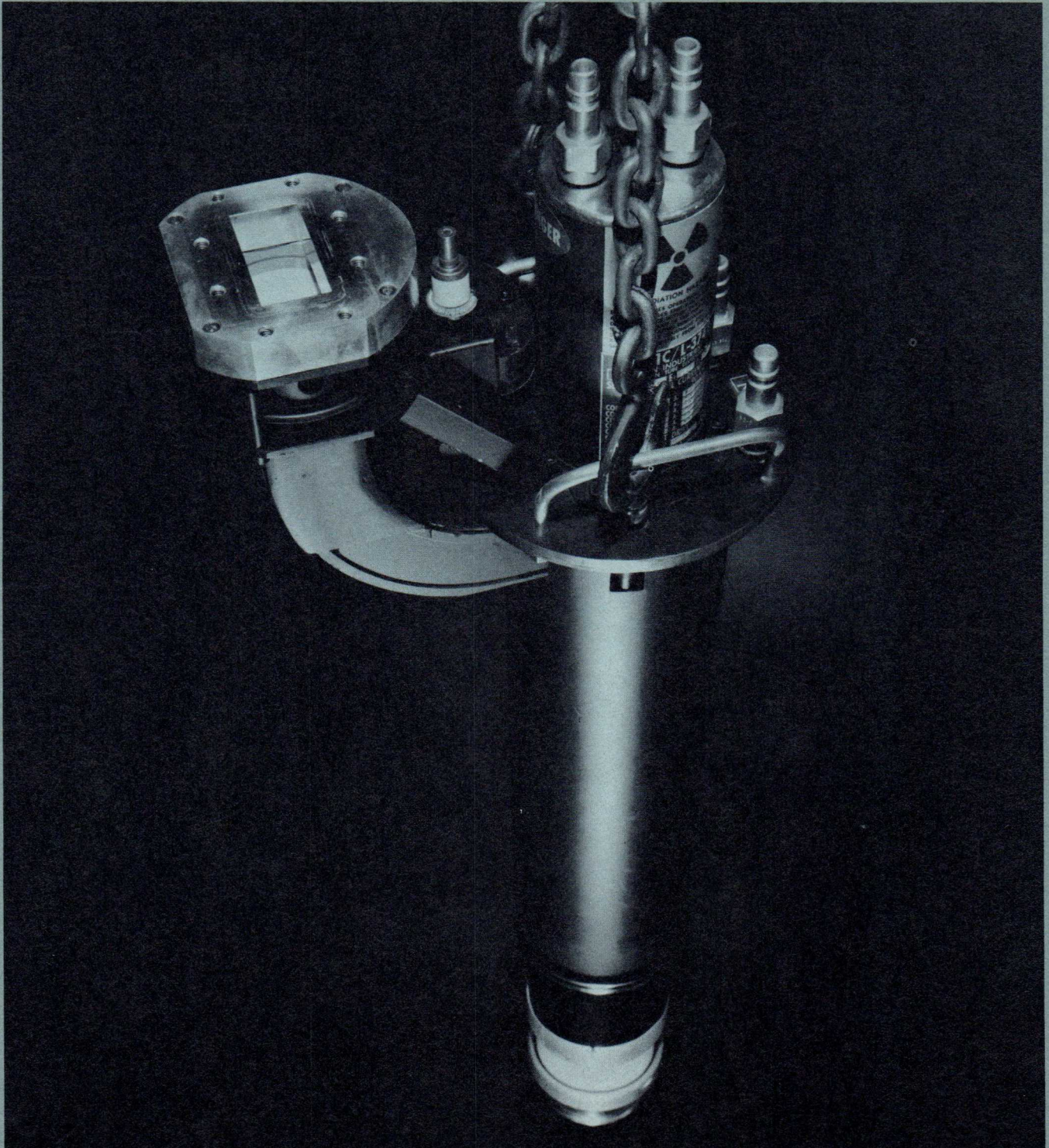
Tube Type	Frequency Range (MHz)	Minimum Power Output (W)	Minimum Small Signal Gain (dB)	Maximum Noise Figure (dB)	Applications/Comments
L-2341-08	500-1000	1.0	27	25	The PPM focused TWT's in this line are primarily designed for laboratory use, or for military applications where low cost and small size are required. The majority of these tubes are qualified to airborne environments.
L-2342-03	1000-2000	2.0	33	25	
L-2331-07	1000-2000	10.0	30	25	
L-2339-03	1000-2000	10.0	30	15	
L-2343-03	2000-4000	1.0	35	20	
L-2347-05	2000-4000	2.0	35	25	
L-2332-07	2000-4000	10.0	30	25	
L-2350-01	2000-4000	5.0	30	20	
L-2344-05	4000-8000	1.0	33	30	
L-2348-02	4000-8000	2.0	33	30	
L-2345-08	7000-12,400	1.0	30	30	
L-2345-02	8000-12,000	2.0	30	30	
L-2366-01	8000-16,000	1.0	30	35	
L-2366-02	12,000-18,000	1.0	30	35	



**ELECTRON TUBE DIVISION**  
San Carlos, California

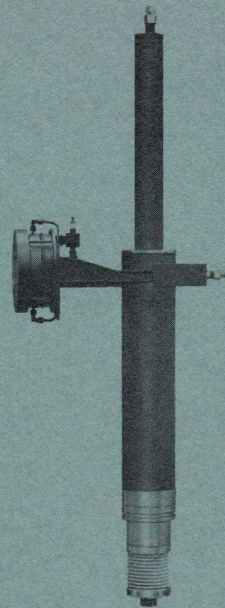


# Klystron Product Summary

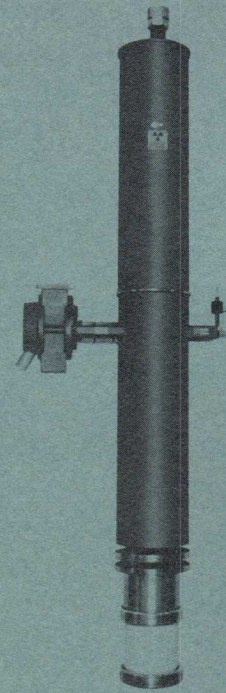




L-3403 120" High



L-3661 70" High



L-5081 100" High

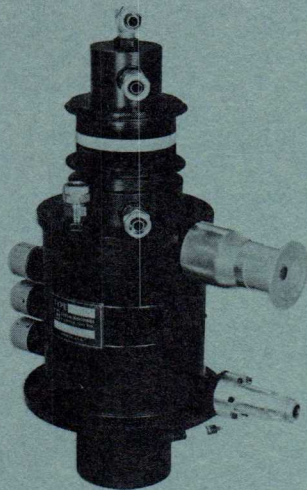
### PULSED, MODULATING ANODE

Tube Type	Frequency Range (MHz)	Tuning	Min. Peak Power Output (Mw)	Average Power Output (kW)	Pulse Width Cathode ( $\mu$ sec)	Min. Gain (dB)	Typical Operating Values			Focus Coil Model	Applications/Comments
							Beam Voltage (kV)	Beam Current (amps)	Mod. Anode Voltage Peak (kv)		
X 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.
X L-3694	400- 450	Mechanical	1.25	75	2100	35	108	35	55	190	
X L-5120	805	Fixed	1.25	150	1000	45	75	40	75	489	Specially designed for particle accelerator applications.

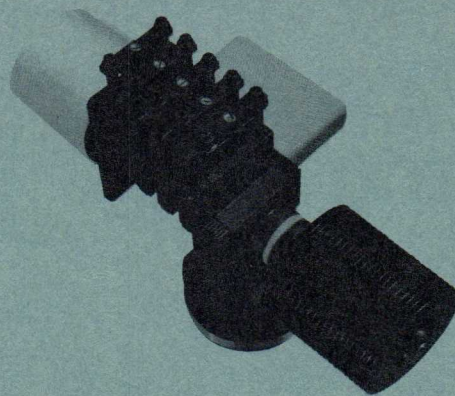
### PULSED

Tube Type	Frequency Range (MHz)	Tuning	Min. Peak Power Output (Mw)	Average Power Output (kW)	Pulse Width Cathode ( $\mu$ sec)	Min. Gain (dB)	Typical Operating Values		Focus Coil Model	Applications/Comments
							Beam Voltage (kV)	Beam Current (amps)		
X L-3742	2980-3100	Broadband	1*	6	10	35	90	52	288	Very high peak and average power with 1.0 dB power flatness across the frequency band. Gain in excess of 50 dB is available.
X 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.
X L-3250	1250-1350	Tunable	10	15	7	36	185	160	46	
X L-5096	1450-1550	Tunable	2.2	7.6	8	36	115	78	201377	
X 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.
X L-3944	1295-1305	Fixed	10	15	8	36	210	150	46	
X L-3660	1295-1305*	Fixed	10	20	32	33	175	171	200	
X L-3661	1290-1310*	Fixed	20	30	10	45	225	260	215	
X L-5081	1295-1305*	Fixed	30	75	12	45	290	300	203	

\*Fixed tuned to a point within this range.



L-5101 10 $\frac{3}{4}$ " Long



L-5195 12 $\frac{1}{10}$ " Long



L-5237 36" Long

### ELECTROSTATICALLY FOCUSED KLYSTRONS

Tube Type	Frequency (MHz)	RF Power Output Min. (kW)	Min. Gain (dB)	Bandwidth 3 dB points (MHz)	Beam Voltage (kV)	Beam Current (amps)	Duty	Cooling	Max. Wt. (lbs.)	Applications/Comments
✓ L-5044	2300	.1	29	6	2.8	.107	CW	Water**	5	<p>Electrostatically focused klystrons retain the best features of magnetically focused klystrons such as high gain, good efficiency, resistance to environment, low harmonic output, and high reliability. In addition, the ESFK offers these important advantages:</p> <ol style="list-style-type: none"> <li>1. Reduced size and weight. (A weight reduction of 3 to 5 times is typical).</li> <li>2. Efficient operation over a wide range of output power. Only the cathode voltage is varied.</li> <li>3. Low noise output (no ion sidebands).</li> <li>4. No magnetic leakage fields to disturb other components in the system.</li> <li>5. High system packaging density possible since there are no focusing magnets.</li> <li>6. Automatic ion removal from the beam eliminates ion bombardment of the cathode and increases life expectancy.</li> </ol>
✓ L-5101	2300	1	30	12	6.5	.370	CW	Water	12	
✓ L-5182	4400-5000	1	45	10	7.5	.420	CW	Water	10	
✓ L-3668W	2740-2820	30	30	15	22.5	4.0	.04	Water	35	
✓ L-3975	3080	1000	36	86	85	28	.001	Water	70	
✓ L-5195*	4455	75	48	16	31	5.2	.005	Air	14	
✓ L-5195	4455	35	45	40	28	4.2	.01	Air	14	
✓ L-5235	1300-1400	300	47	10	60	15	.015	Water	124	
✓ L-5237	1300-1400	300	47	10	60	15	.007	Air	145	
✓ L-5248	1230	15	40	13	21	3	.007	Air	31	

\*Operated at increased voltage.

\*\*May be conduction cooled.

## REFLEX KLYSTRONS / BROADBAND DISC SEAL KLYSTRONS

Type Tube	Reflector Mode	Frequency (MHz)	Resonator Voltage (Vdc)	Reflector Voltage (Vdc)	Cathode Current (mAcd)	CW Power Output (mW)	Control Electrode		Applications/Comments
							Voltage During Operation (Vdc)	Bias Voltage (Vdc)	
6BM6	1 $\frac{3}{4}$	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.
	2 $\frac{3}{4}$	1100-3000	325	-220 (2200 MHz)	21	100 (2200 MHz)	0	-	
	3 $\frac{3}{4}$	1500-3800	325	-210 (3000 MHz)	21	40 (3000 MHz)	0	-	
6BM6A	1 $\frac{3}{4}$	550-2300	325	-235 (1500 MHz)	21	170 (1500 MHz)	0	-300	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 $\frac{3}{4}$	1100-3000	325	-220 (2200 MHz)	21	100 (2200 MHz)	0	-300	
	3 $\frac{3}{4}$	1500-3800	325	-210 (3000 MHz)	21	40 (3000 MHz)	0	-300	
6BL6	1 $\frac{3}{4}$	1400-4000	325	-230 (2500 MHz)	26	250 (2500 MHz)	0	-	
	2 $\frac{3}{4}$	2100-4600	325	-140 (3200 MHz)	26	125 (3200 MHz)	0	-	
	3 $\frac{3}{4}$	3000-6500	325	-200 (5000 MHz)	26	30 (5000 MHz)	0	-	

## SALES OFFICES

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for consultation at San Carlos, and at our Williamsport Facility, 1035 Westminster Drive, Williamsport, Pa. 17701. Phone: (717) 326-3561. Telex 84-1430.

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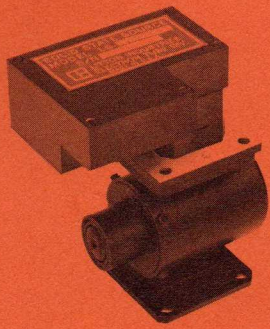
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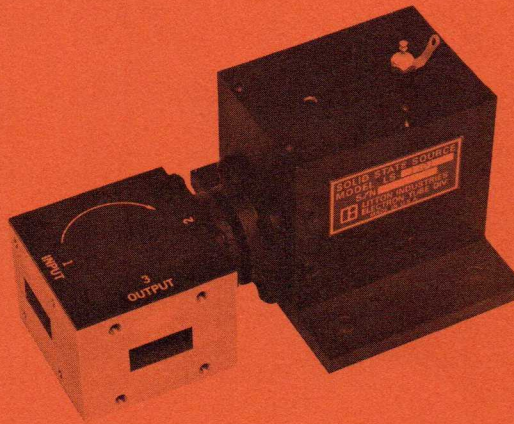
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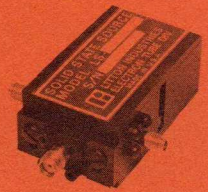
LS-1002 3<sup>11</sup>/<sub>16</sub>" High



LS-1405 2<sup>1</sup>/<sub>2</sub>" High



LS-1301 6<sup>5</sup>/<sub>16</sub>" Long



LS-1508 2.2" Long

# Microwave Solid-State Sources

## LS-1000 SERIES

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
LS-1001	9.05	20.0	Fixed	12.0	0.5	WG	56	LS-1000 Series fixed tuned cavity stabilized sources utilize a Gunn diode oscillator, stabilized by a high Q cavity to provide low noise performance at high efficiency. Sources are available within the 8.0 to 18.0 GHz range with output powers to 500 mW. Integral power supplies are also available.
LS-1002	9.33	1.0	Fixed	15.0 <sup>1</sup>	0.5	WG	13	
LS-1003	11.7	50.0	Fixed	15.0 <sup>1</sup>	0.45	SMA	35	

Note 1. Integral voltage regulator

## LS-1100 SERIES

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
LS-1101	8.0-9.1	20.0	200	12.0	0.5	WG	56	LS-1100 Series cavity stabilized sources feature single knob mechanical tuning, long term frequency stability and high efficiency. These sources use a single active Gunn device and a sealed stabilization cavity to achieve high reliability. Applications include CW and pulsed doppler radars and low noise receiver L.O.'s.
LS-1102	9.375	10.0	±30	15.0 <sup>1</sup>	0.45	WG	50	
LS-1103	10.2-10.7	25.0	500	15.0 <sup>1</sup>	0.75	WG	38	
LS-1104	10.25-10.5	25.0	250	15.0 <sup>1</sup>	0.75	WG	32	

Note 1. Integral voltage regulator

## LS-1300 SERIES

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
LS-1301	10.7-11.7	1000.0	1000	15.0	3.2	WG	112	The LS-1300 Series of 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%. Integral circulators and voltage regulators are provided.

## LS-1400 SERIES

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
LS-1401	8.2-9.2	25.0	1000	—	—	8.0	0.5	SMA	4	This Series of mechanically tuned Gunn diode sources provide output powers to 1 watt within the 7.0 to 18.0 GHz frequency range. Some models have electronic tuning capability with up to 100 MHz bandwidth. They are direct replacements for reflex klystrons in radars, communications and test equipment, and are available with or without an integral power supply/regulator or load isolator.
LS-1402	13.3	10.0	±50	40	0-40	7.0	0.5	WG	3	
LS-1403	13.325	50.0	±5	.06	1 (p-p)	12.0 <sup>1</sup>	0.5	WG	12	
LS-1404	15.9-16.4	10.0	600	100	0-50	7.0	0.5	WG	3	
LS-1405	9.2-9.8	100.0	600	40	0-50	10.0	0.8	WG	10	
LS-1407	8.9-10.0	40.0	1100	40	0-40	15.0 <sup>1 2 3</sup>	0.6	SMA	58	
LS-1408	7.0	10.0	±100	—	—	13.0 <sup>1</sup>	0.5	SMA	15	
LS-1409	8.0	10.0	±50	—	—	13.0 <sup>1</sup>	0.5	SMA	14	
LS-1410	11.0	10.0	±50	—	—	13.0 <sup>1</sup>	0.5	SMA	14	
LS-1411	14.0	10.0	±50	—	—	13.0 <sup>1</sup>	0.5	SMA	14	
LS-1412	17.0	10.0	±100	—	—	13.0 <sup>1</sup>	0.5	SMA	13	
LS-1414	10.7-11.7	1000.0	1000	80	0-60	10.0	3.2	WG	58	
LS-1415	13.31-13.34	50.0	30	5	11-13	7.5	0.8	WG	4	
LS-1416	9.39-9.45	30.0	60	60	2-50	9.5	0.4	WG	8	
LS-1417	13.31-13.34	200.0	30	5	11-13	10.0	0.7	WG	4	
LS-1418	8.0	200.0	±50	—	—	15.0	1.8	SMA	16	
LS-1419	14.0	200.0	±50	—	—	15.0	1.8	SMA	15	
LS-1420	8.8	250.0	±10	—	—	8.0	2.0	WG	8	
LS-1421	13.325	250.0	±15	—	—	8.0	2.0	WG	7	
LS-1422	7.0-7.5	25.0	500	—	—	8.0	0.5	SMA	5	
LS-1423	12.7-13.0	4.0	300	20	2-12	9.0	0.3	SMA	4	
LS-1424	12.4-13.0	1000.0	600	50	5-60	8.5	4.8	WG	18	

## LS-1500 SERIES

Type No.	Frequency (GHz)	Minimum Power Output (mW)	Tuning Range, Electrical (MHz)	Typical Tuning Voltage (V)	Typical Bias Voltage (Vdc)	Typical Bias Current (A)	Output Connector	Approx. Weight (oz.)	Applications/Comments
LS-1501	8.5-9.0	50.0	500	0 to -60	8.0	1.0	SMA	6	The LS-1500 Series sources are electronically tuned and provide wide tuning ranges with near-linear frequency vs. tuning voltage characteristics. Gunn diodes are used to provide clean spectral output. They are available within the 6.0 to 18.0 GHz range, with output powers to 50 mW.
LS-1502	9.8-10.9	10.0	1100	0 to -60	9.0	0.5	SMA	5	
LS-1503	16.5-17.0	20.0	500	0 to -60	8.0	0.6	SMA	5	
LS-1504	13.3-13.4	3.0	100	0 to -20	8.0	0.4	SMA	5	
LS-1505	10.2-11.2	15.0	1000	0 to -50	9.0	0.6	WG	10	
LS-1506	6.0-8.0	10.0	2000	0 to -67	-10.0	0.6	SMA	4	
LS-1508	8.0-10.0	15.0	2000	0 to -68	-10.0	0.7	SMA	4	
LS-1510	9.0-11.0	0.6	2000	0 to +65	-10.0	1.0	SMA	4	

Notes: 1. Integral voltage regulator 2. Integral temperature controller 3. Integral load isolator

## GUNN DIODES

Litton offers its line of Gunn diodes to those equipment manufacturers who build their own solid-state sources. These diodes are produced to the same rigid specifications as those used in Litton solid-state sources and amplifiers, and provide equally high performance and reliability. They are available from 6 GHz to 36 GHz, at power levels ranging from 10 mW to 500 mW. All diodes are hermetically sealed and are "burned-in" at higher than rated input power, to insure reliable operation. Litton Gunn diodes are produced in both standard prong and screw thread packages, with custom package designs available for individual requirements.

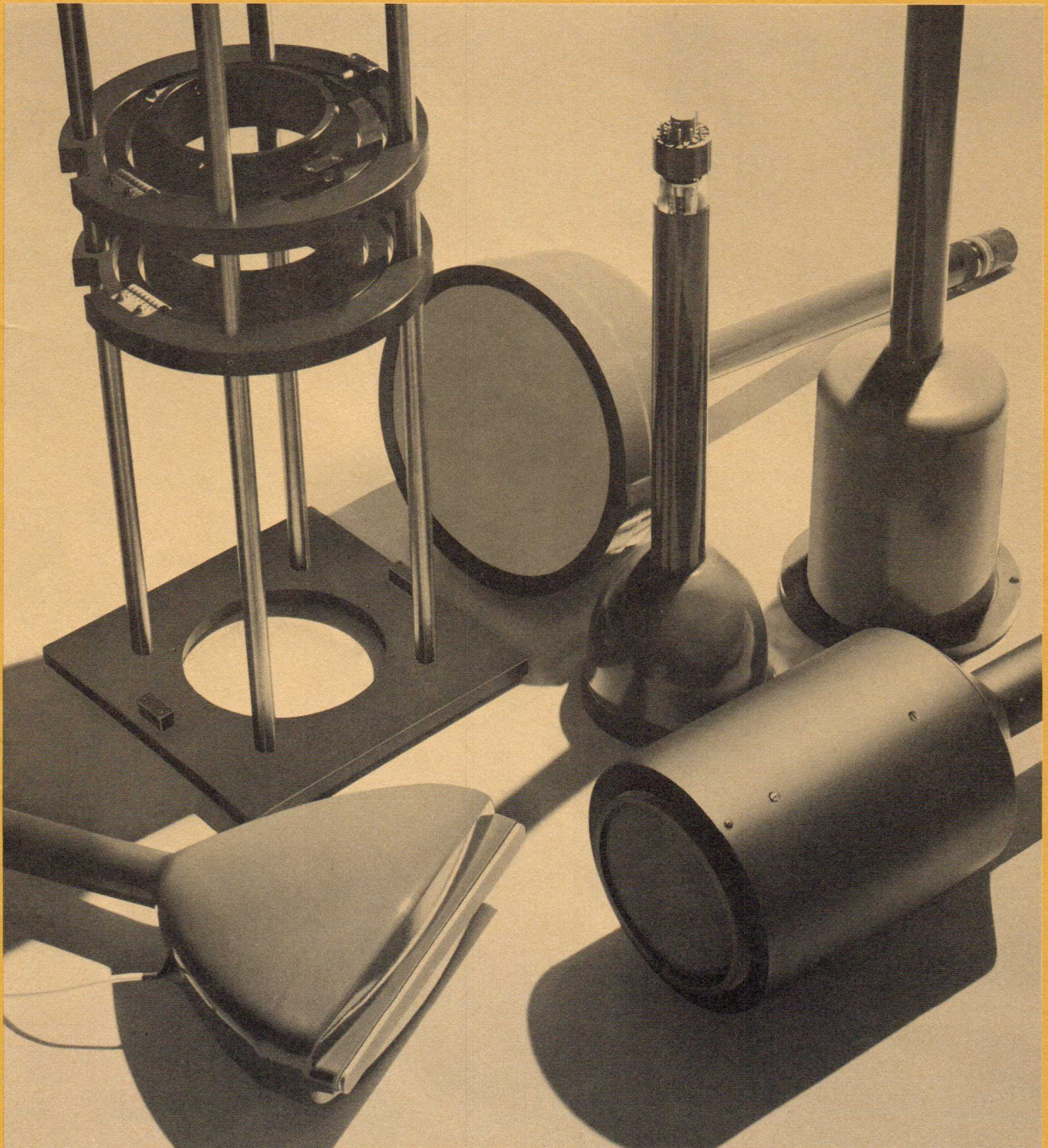


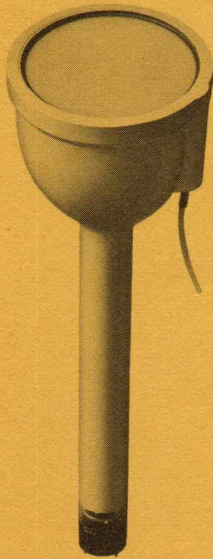
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# Cathode Ray Tube Product Summary

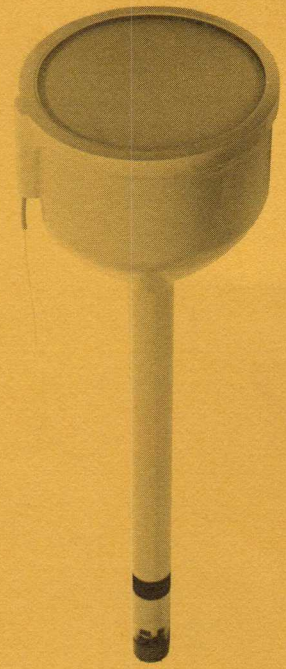




L-4256 19 1/2" Long



L-4246 27" Long



L-4236 26" Long

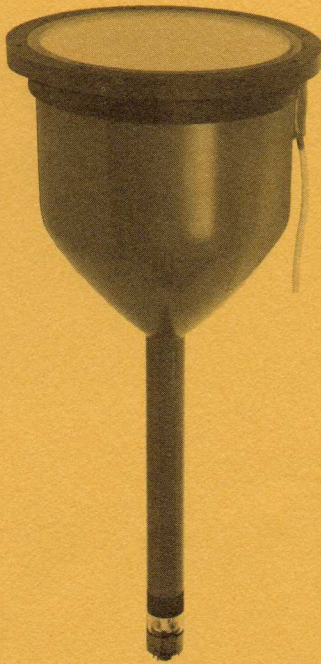
### FLAT FACE CATHODE RAY TUBES

for Recording and Scanning / Electro-magnetic Deflection and Focus

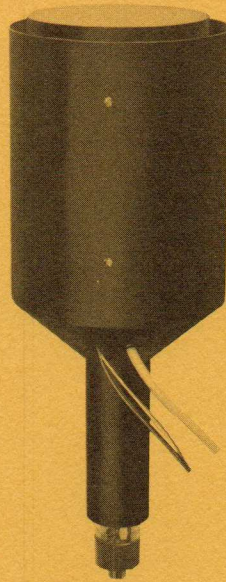
Type Number	Nominal Face Size	Gun Type	Deflection Angle	Applications and/or Special Characteristics	Spot Size	
					2-Slit Analyzer-50%	SRM*
X L-4108	5" diameter	"A"	40°	Available for projection		.0013"
X L-4119	5" diameter	"A"	40°	Special P24 color phosphor		.0014"
X L-4114	5" diameter	"S"	40°	Airborne, ruggedized		.001"
X L-4123	5" diameter	"S"	40°		.0011"	.0008"
X L-4238	5" diameter	"SS"	40°		.0007"	
X L-4256	5" diameter	"L"	40°		.0005"	
X L-4251	5" diameter	"S"	26°	Low cost "COM" tube		.0012"
X L-4125	5" diameter	"S"	24°		.0015"	
X L-4246	5" diameter	"L"	20°		.0007"	
X L-4200	5" diameter	"S"	16°			.001"
X L-4197	7" diameter	"A"	40°			.0015"
X L-4104	7" diameter	"S"	40°			.0008"
X L-4236	7" diameter	"SS"	40°		.0008"	
X L-4257	9" diameter	"A"	52°	Sub-mount screen		.002"
X L-4192	9" diameter	"S"	40°			.001"
X L-4210	9" diameter	"S"	52°			.0008"
X L-4245	9" diameter	"SS"	52°		.001"	
X L-4192-01	9" diameter	"L"	40°	Used for artwork generation	.001"	
X L-4129-01	21" diagonal	"A"	70°	Rectangular, Implosion panel, P4 phosphor		.005"

\*Shrinking Raster Measurement

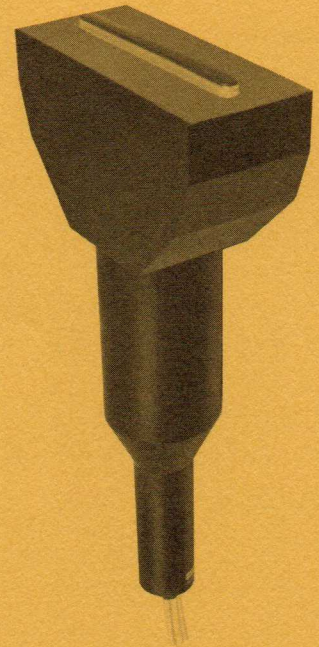
NOTE: Detailed specifications are given on individual data sheets, where available. All screens are metalized. All measurements on P11 at 0.50 to 1.0µa beam current. "A" Gun—Medium High Resolution; High Current. "S" Gun—High Resolution. "SS" Gun—Extra-High Resolution. "L" Gun—Ultra-High Resolution.



L-4192-01 26" Long



PL-4146-03 17 1/2" Long



PL-4167-01 22" Long

### FLAT FACE CATHODE RAY TUBES

for Recording and Scanning / Electrostatic Focus, Electro-magnetic Deflection  
All measurements on P11 at 0.5 to 1.0  $\mu$ a beam current.

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

### FIBER OPTIC CATHODE RAY TUBES

Electro-magnetic Deflection and Focus. Available in a range of N.A. and fiber sizes. Special options such as coatings and shapes available. Anode voltages up to 40 kv on some types.

Type Number	Size	Shape	Screen Dimensions	Gun Type	Deflection Angle	Special Characteristics	Special Characteristics	Spot Size
X L-4141	1 1/2"	Square	1 1/4" sq.	"A"				.0012"
X L-4142	2"	Square	1 5/8" sq.	"A"	40°			.0012"
X L-4188	2"	Round	1 5/8" dia.	"A"	40°	Spherical Inside Face	High Output P16	.002"
X L-4166	2 5/8"	Square	2 1/4" sq.	"A"	30°			.0012"
X L-4216	3"	Line scan	2 7/16" x 3/16"	"A"	36°	Cylindrical Outside Face		.0012"
X L-4198	3 1/2"	Round	3 3/16" dia.	"A"	30°	Spherical Inside Face		.0012"
X L-4221	5"	Round	4 1/4" dia.	"A"	40°			.0012"
X L-4167	8 1/2"	Line scan	8 1/4" x 3/16"	"A"	55°			.0015"
X L-4186	9 1/4"	Line scan	9 1/4" x 3/16"	"A"	60°			.0015"
X L-4196	3"	Line scan	2 7/16" x 3/16"	"S"	36°	Cylindrical Outside Face		.0008"
X L-4183	5"	Line scan	4 3/8" x 3/8"	"S"	40°			.0008"
X L-4199	5"	Round	4 1/4" dia.	"S"	40°			.0008"
X L-4201	5"	Round	4 1/4" dia.	"S"	24°			.0015"
X L-4190	8 1/2"	Line scan	8 1/4" x 3/16"	ES	55°	Electrostatic Focus		.003"
X 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-4240	7" diameter	"A"	52°	EM focus; Radar Display; P7 phosphor		.005"
PL-4167-01	8 1/4" strip	"S"	55°	EM focus; L-4167-01 fiber optic line scan CRT		.001"

## PRECISION TUBE MOUNTING STRUCTURES

Available for any Litton cathode ray tube

**Model 90674** Has separate X, Y, pitch, yaw, and Z adjustments; precision rotation adjustment for deflection coil. All adjustments can be actuated and locked through small access hole in magnetic shield, while shield is in place. No backlash, positive adjustments with high ratio of turns to movement for precision systems. Crosstalk is less than 1 part in 10,000. All non-magnetic materials; adaptable to almost any mechanical interface. Magnetic shields also available.

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 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. Electron Tube Sales Offices are listed below:

**EAST**  
265 Monmouth Park Highway  
West Long Branch, New Jersey 07764  
(201) 542-7101

**DISTRICT OF COLUMBIA**  
1875 Connecticut Avenue, NW  
Suite 1013, Universal Bldg. North  
Washington, D.C. 20009  
(202) 462-8833

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

**MIDWEST**  
55 North Central Avenue  
Fairborn, Ohio 45324  
(513) 878-6122

**SOUTHWEST**  
11333 North Central Expressway  
Suite 211  
Dallas, Texas 75231  
(214) 369-2184

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

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

### LITTON PRECISION PRODUCTS INTERNATIONAL

120 Avenue des Champs Elysees  
Paris 8, France

Newtonstrasse 13  
8 Munich 80, West Germany

Via Arco 4  
I 20121 Milan, Italy

95 High Street  
Slough, Buckinghamshire  
England

Sköldungagatan 4  
Fack  
S-100 41 Stockholm 26, Sweden

Steenloperstraat 26  
Capelle a/d IJssel  
Holland

Gubelstrasse 28  
8050 Zurich, Switzerland

**DENLEN CORPORATION, LTD.**  
23 Guardsman Road  
Thornhill, Ontario, Canada  
(416) 889-7201

**WESTREX COMPANY, ORIENT**  
Central P. O. Box 760  
Tokyo, Japan

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



LITTON INDUSTRIES ELECTRON TUBE DIVISION • SAN CARLOS, CALIFORNIA

# Tube Listing by Center Frequency

Tube Number	Tube Type	Center Frequency (MHz)	Power Output	Frequency Range (MHz)	Section (Color)	Tube Number	Tube Type	Center Frequency (MHz)	Power Output	Frequency Range (MHz)	Section (Color)
L-3403	Kly.	425	1.25 Mw	400—450	Blue	6481	Planar	—	2.0 w	to 3300	Gray
L-3694	Kly.	425	1.25 Mw	400—450	Blue	L-2333-11	TWT	3900	10 mW	2600—5200	Green
L-3456	CW Mag.	470	200 W	350—590	Gray	L-2787	TWTA	3900	10 mW	2600—5200	Green
L-3500	CW Mag.	470	100 W	350—590	Gray	L-2786	TWTA	3900	1 W	2600—5200	Green
L-3714	CW Mag.	600	175 W	475—725	Gray	L-2352-03	TWT	3900	1.0 W	2600—5200	Green
L-2341-08	TWT	750	1.0 W	500—1000	Green	L-5323	TWT	3900	200 W	2600—5200	Green
L-3501	CW Mag.	782	100 W	590—975	Gray	6BL6	R. Kly.	3950	30-250 mW	1400—6500	Blue
L-3459	CW Mag.	782	200 W	590—975	Gray	L-5121	TWT	3950	2.0 W	2600—5300	Green
L-5120	Kly.	805	1.25 Mw	805	Blue	L-5320	TWT	3975	1 kW	2650—5300	Green
L-3721	MBWO	1200	200 W	1000—1400	Gray	L-5321	TWT	3975	1 kW	2650—5300	Green
L-5248	ESFK	1230	15 kW	1230	Blue	2C36	Planar	—	1.0 w	to 4000	Gray
L-3465A	CW Mag.	1237	400 W	975—1500	Gray	L-3461A	CW Mag.	4275	350 W	3575—4975	Gray
L-3502A	CW Mag.	1237	110 W	975—1500	Gray	L-3505A	CW Mag.	4275	110 W	3575—4975	Gray
L-3035	Kly.	1300	2.2 Mw	1240—1360	Blue	L-5195	ESFK	4455	35 kW	4455	Blue
L-3250	Kly.	1300	10 Mw	1250—1350	Blue	L-5195	ESFK	4455	75 kW	4455	Blue
L-3660	Kly.	1300	10 Mw	1295—1350	Blue	L-5182	ESFK	4700	1 kW	4400—5000	Blue
L-3661	Kly.	1300	20 Mw	1290—1310	Blue	L-5134	TWT	5100	10 W	3700—6500	Green
L-3943	Kly.	1300	5 Mw	1295—1305	Blue	L-3729A	MBWO	5135	220 W	4360—5910	Gray
L-3944	Kly.	1300	10 Mw	1295—1305	Blue	L-3897	Mag.	5200	175 kw	4950—5450	Gray
L-5081	Kly.	1300	30 Mw	1295—1305	Blue	L-5408	CFA	—	500 kw	C-band	Gray
L-5235	ESFK	1350	300 kW	1300—1400	Blue	L-5317	MBWO	5450	100 W	4700—6200	Gray
L-5237	ESFK	1350	300 kW	1300—1400	Blue	L-3467A	CW Mag.	5575	400 W	4975—6175	Gray
L-2342-03	TWT	1500	2.0 W	1000—2000	Green	L-3506A	CW Mag.	5575	110 W	4975—6175	Gray
L-3845	TWT	1500	1.0 W	1000—2000	Green	L-5080	Mag.	5637	250 kw	5450—5825	Gray
L-2331-07	TWT	1500	10 W	1000—2000	Green	6344A	Mag.	5637	175 kw	5450—5825	Gray
L-2339-03	TWT	1500	10 W	1000—2000	Green	7156A	Mag.	5637	250 kw	5450—5825	Gray
L-5036	TWT	1500	10 W	1000—2000	Green	7460	Mag.	5637	250 kw	5450—5825	Gray
L-5155	TWT	1500	20 W	1000—2000	Green	L-3726	MBWO	5675	165 W	4800—6550	Gray
L-5096	Kly.	1500	2.2 Mw	1450—1550	Blue	6503	Planar	—	25 mW	to 5750	Gray
L-5332	CFA	—	500 kw	S-band	Gray	L-2357-03	TWT	6000	10 mW	4000—8000	Green
L-5373	CFA	—	500 kw	S-band	Gray	L-2781	TWTA	6000	10 mW	4000—8000	Green
L-3464A	CW Mag.	1925	400 W	1500—2350	Gray	L-2357-06	TWT	6000	10 mW	4000—8000	Green
L-3503A	CW Mag.	1925	110 W	1500—2350	Gray	L-5218	TWT	6000	40 mW	4000—8000	Green
6BM6A	R. Kly.	2175	40-170 mW	550—3800	Blue	L-2335-17	TWT	6000	1.0 W	4000—8000	Green
6BM6	R. Kly.	2175	40-170 mW	550—3800	Blue	L-2344-05	TWT	6000	1.0 W	4000—8000	Green
L-5225	TWT	2200	10 W	1700—2700	Green	L-2784	TWTA	6000	1 W	4000—8000	Green
L-5044	ESFK	2300	100 W	2300	Blue	L-2348-02	TWT	6000	2.0 W	4000—8000	Green
L-5101	ESFK	2300	1 kW	2300	Blue	L-3996	TWT	6000	2.0 W	5000—7000	Green
L-5261A	CW Mag.	2450	625 W	2450	Gray	L-5009	TWT	6000	2.0 W	4000—8000	Green
L-5260A	CW Mag.	2450	750 W	2450	Gray	L-5015	TWT	6000	10 mW	4000—8000	Green
L-3189	CW Mag.	2450	1.35 kW	2450	Gray	L-5011	TWT	6000	10 W	4000—8000	Green
L-3858	CW Mag.	2450	2.65 kW	2450	Gray	L-5083	TWT	6000	20 W	4000—8000	Green
L-5001	CW Mag.	2450	1.30 kW	2450	Gray	L-5263	TWT	6000	1 kW	4000—8000	Green
L-3668W	ESFK	2780	30 kw	2740—2820	Blue	L-3468A	CW Mag.	6725	300 W	6175—7275	Gray
L-3460A	CW Mag.	2962	500 W	2350—3575	Gray	L-3507A	CW Mag.	6725	110 W	6175—7275	Gray
L-3504A	CW Mag.	2962	110 W	2350—3575	Gray	L-2357-04	TWT	7500	10 mW	5000—10000	Green
5768	Planar	—	—	to 3000	Gray	L-2789	TWTA	7500	10 mW	5000—10000	Green
L-2333-08	TWT	3000	10 mW	2000—4000	Green	L-2335-16	TWT	7500	1.0 W	5000—10000	Green
L-2333-06	TWT	3000	10 mW	2000—4000	Green	L-2788	TWTA	7500	1 W	5000—10000	Green
L-2780	TWTA	3000	10 mW	2000—4000	Green	L-5324	TWT	7500	200 W	5000—10000	Green
L-2330-13	TWT	3000	1.0 W	2000—4000	Green	L-3462A	CW Mag.	8025	300 W	7275—8775	Gray
L-2343-03	TWT	3000	1.0 W	2000—4000	Green	L-3508A	CW Mag.	8025	110 W	7275—8775	Gray
L-2783	TWTA	3000	1 W	2000—4000	Green	L-5371	CFA	—	50-80 kw	X-band	Gray
L-3971	TWT	3000	1.0 W	2400—3600	Green	L-5334	CFA	—	500 kw	X-band	Gray
L-2347-05	TWT	3000	2.0 W	2000—4000	Green	L-5372	CFA	—	500 kw	X-band	Gray
L-5007	TWT	3000	2.0 W	2000—4000	Green	L-5154	TWT	8150	5 W	7900—8400	Green
L-2350-01	TWT	3000	5.0 W	2000—4000	Green	L-5380	TWT	8150	15 W	7900—8400	Green
L-2332-07	TWT	3000	10 W	2000—4000	Green	L-3957	TWT	8200	2.0 W	5400—11000	Green
L-5010	TWT	3000	10 W	2000—4000	Green	L-3798	Mag.	8535	300 w	8520—8550	Gray
L-5014	TWT	3000	10 mW	2000—4000	Green	L-3039R	Mag.	8790	225 kw	8790±90	Gray
L-5160	TWT	3000	20 W	2000—4000	Green	L-3089B	Mag.	8800	40 w	8800±25	Gray
L-5095	TWT	3000	50 W	2000—4000	Green	L-3039D	Mag.	8800	225 kw	8800±20	Gray
L-5281	TWT	3000	250 W	2000—4000	Green	L-3039E	Mag.	8860	225 kw	8860±20	Gray
L-5283	TWT	3000	1 kW	2000—4000	Green	L-3956	Mag.	8900	4.5 kw	8900±20	Gray
L-5336	TWT	3000	1 kW	2000—4000	Green	L-3039F	Mag.	8920	225 kw	8920±20	Gray
L-3724A	MBWO	3025	220 W	2500—3550	Gray	L-4310	Mag.	8950	200 kw	8500—9400	Gray
L-3742	Kly.	3040	1.0 Mw	2980—3100	Blue	L-3039G	Mag.	8980	225 kw	8980±20	Gray
L-5316	MBWO	3050	100 W	2600—3500	Gray	L-3030B	Mag.	9000	300 kw	9000±30	Gray
L-3975	ESFK	3080	1 Mw	3080	Blue	L-2337-18	TWT	9000	10 mW	7000—11000	Green
L-5366	TWT	3250	3 kW	3000—3500	Green	L-2782	TWTA	9000	10 mW	7000—11000	Green
2C37	Planar	—	2.0 w	to 3300	Gray	L-3928	TWT	9000	10 W	7000—11000	Green
5767	Planar	—	2.0 w	to 3300	Gray	L-3998	TWT	9000	2.0 W	7000—11000	Green

## TYPE DESIGNATIONS

CFA—Crossed Field Amplifier  
 CW Mag.—Continuous Wave Magnetron  
 ESFK—Electrostatically Focused Klystron

Kly.—Klystron  
 Mag.—Magnetron  
 MBWO—M-type Backward Wave Oscillator

Planar—Planar Triode  
 R. Kly.—Reflex Klystron  
 TWT—Traveling Wave Tube

TWTA—Traveling Wave Tube Amplifier

Tube Number	Tube Type	Center Frequency (MHz)	Power Output	Frequency Range (MHz)	Section (Color)	Tube Number	Tube Type	Center Frequency (MHz)	Power Output	Frequency Range (MHz)	Section (Color)
L-2337-14	TWT	9000	10 mW	7000—11000	Green	L-5250	TWT	9450	25 kW	9200—9700	Green
L-5023	TWT	9000	20 mW	7000—11000	Green	L-5293	TWT	9500	10 W	7000—12000	Green
L-5043	TWT	9000	10 W	7000—11000	Green	L-5209	Mag.	9500	12.5 kW	9200—9800	Gray
L-5045	TWT	9000	1.0 W	7000—11000	Green	L-5255	TWT	9600	25 kW	9300—9900	Green
L-5275	TWT	9000	20 W	7000—11000	Green	L-3463A	CW Mag.	9625	250 W	8775—10475	Gray
L-5318	MBWO	9000	100 W	8500—9500	Gray	L-3509A	CW Mag.	9625	110 W	8775—10475	Gray
L-5280	TWT	9000	200 W	7000—11000	Green	L-2337-23	TWT	9700	10 mW	7000—12400	Green
L-5089	TWT	9000	1 kw	7000—11000	Green	L-2338-20	TWT	9700	1.0 W	7000—12400	Green
L-5126	TWT	9000	1 kw	7000—11000	Green	L-2345-08	TWT	9700	1.0 W	7000—12400	Green
L-5273	Mag.	9050	95 kw	8500—9600	Gray	L-2785	TWTA	9700	1 W	7000—12400	Green
L-4469/8855	Mag.	9050	200 kw	8500—9600	Gray	L-5253	TWT	9750	40 kW	9400—10100	Green
L-4575	Mag.	9050	200 kw	8500—9600	Gray	L-3728	MBWO	9750	150 W	8500—11000	Gray
L-3039H	Mag.	9040	225 kw	9040±20	Gray	L-4264	Mag.	9800	20 kw	9600—10000	Gray
5780	Mag.	9050	250 kw	8500—9600	Gray	L2345-02	TWT	10,000	2.0 W	8000—12000	Green
6543	Mag.	9050	65.0 kw	8500—9600	Gray	L-5008	TWT	10,000	2.0 W	8000—12000	Green
6543A	Mag.	9050	65.0 kw	8500—9600	Gray	L-5339	TWT	11,000	1 W	8000—14000	Green
7111	Mag.	9050	200 kw	8500—9600	Gray	L-5322	TWT	11,000	2 W	8000—14000	Green
7950	Mag.	9050	208 kw	8500—9600	Gray	L-2798	TWTA	12,000	10 mW	8000—16000	Green
L-3103	Mag.	9050	30.0 kw	8500—9600	Gray	L-2365-01	TWT	12,000	10 mW	8000—16000	Green
L-4193/7008	Mag.	9050	200 kw	8500—9600	Gray	L-2364-01	TWT	12,000	1.0 W	8000—16000	Green
L-4193C	Mag.	9050	90 kw	8500—9600	Gray	L-2366-01	TWT	12,000	1.0 W	8000—16000	Green
L-4490	Mag.	9050	200 kw	8500—9600	Gray	L-2795	TWTA	12,000	1 W	8000—16000	Green
L-4502	Mag.	9050	200 kw	8700—9400	Gray	L-4370	Mag.	13,325	40 W	13325±30	Gray
L-5149	Mag.	9050	200 kw	8500—9600	Gray	L-5189	Mag.	14,200	1.0 kw	14200±150	Gray
L-3039I	Mag.	9100	225 kw	9100±20	Gray	L-2365-03	TWT	15,000	10 mW	12000—18000	Green
L-3972	TWT	9100	1.0 W	8200—10000	Green	L-2797	TWTA	15,000	10 mW	12000—18000	Green
L-3379	Mag.	9150	1.0 kw	8800—9500	Gray	L-2364-05	TWT	15,000	1.0 W	12000—18000	Green
L-3380	Mag.	9150	2.0 kw	8800—9500	Gray	L-2366-02	TWT	15,000	1.0 W	12000—18000	Green
L-3381	Mag.	9150	3.0 kw	8800—9500	Gray	L-2796	TWTA	15,000	1 W	12000—18000	Green
L-3382	Mag.	9150	4.0 kw	8800—9500	Gray	L-5227	TWT	15,200	2 W	12400—18000	Green
L-3039J	Mag.	9160	225 kw	9160±20	Gray	L-5117	TWT	15,200	3 W	12400—18000	Green
L-5252	TWT	9200	12 kW	8900—9500	Green	L-3958	Mag.	15,500	9.0 kw	15500±85	Gray
L-3030C	Mag.	9200	300 kw	9200±30	Gray	L-3958A	Mag.	15,500	9.0 kw	15500±85	Gray
L-3039K	Mag.	9220	225 kw	9220±20	Gray	L-5113	Mag.	15,550	2.2 kw	15400—15700	Gray
L-3036F	Mag.	9245	65.0 kw	9245±30	Gray	L-5328	Mag.	15,550	2.5 kw	15400—15700	Gray
L-5407	Mag.	9250	75 kw	9000—9500	Gray	7208B	Mag.	16,000	125 kw	15500—17500	Gray
L-5224A	Mag.	9250	85 kw	9000—9500	Gray	L-5013	Mag.	16,000	4.0 kw	15500—16500	Gray
L-5333	Mag.	9250	85 kw	9000—9500	Gray	L-5035	Mag.	16,150	8.0 kw	15900—16400	Gray
L-3036B	Mag.	9275	65.0 kw	9275±15	Gray	L-3645	Mag.	16,200	4.0 kw	16200±100	Gray
L-3039L	Mag.	9280	225 kw	9280±20	Gray	L-5383	Mag.	16,250	200 w	16200—16300	Gray
L-5145	Mag.	9285	1.0 kw	9275—9295	Gray	L-5383A	Mag.	16,250	200 w	16200—16300	Gray
L-5224	Mag.	9300	75 kw	9100—9500	Gray	L-5271	Mag.	16,250	800 w	16200—16300	Gray
L-3105	Mag.	9300	100 w	9300±40	Gray	L-3496A	Mag.	16,250	1.0 kw	16000—16500	Gray
L-3813	Mag.	9300	500 w	9300±30	Gray	L-5450	Mag.	16,250	35 kw	16250±25	Gray
L-5104	Mag.	9300	120 w	9290—9310	Gray	L-3978	Mag.	16,250	70.0 kw	16000—16500	Gray
7006	Mag.	9300	190 kw	9000—9600	Gray	L-5042	Mag.	16,250	80 kw	16000—16500	Gray
L-3028D	Mag.	9305	120 w	9280—9330	Gray	L-5048	Mag.	16,250	1.0 kw	15950—16550	Gray
L-3601	Mag.	9327	120 w	9315—9340	Gray	L-3915	Mag.	16,280	2.2 kw	16260—16300	Gray
L-3225	Mag.	9330	1.0 kw	9310—9350	Gray	L-5049	Mag.	16,475	50 kw	16145—16805	Gray
L-3039M	Mag.	9340	225 kw	9340±20	Gray	L-5200	Mag.	16,500	35 kw	16000—17000	Gray
L-5274	Mag.	9345	7.5 kw	9345±20	Gray	L-3083A	Mag.	16,500	60 kw	16000—17000	Gray
L-5362	Mag.	9345	10 kw	9345±20	Gray	L-3101A	Mag.	16,500	60 kw	16000—17000	Gray
L-5365	Mag.	9345	28 kw	9345±30	Gray	L-3950	Mag.	16,500	60.0 kw	16500±100	Gray
2J42	Mag.	9375	7 kw	9375±30	Gray	L-3976	Mag.	16,500	100 kw	16500±150	Gray
2J42H	Mag.	9375	7 kw	9375±30	Gray	L-3987	Mag.	16,500	60 kw	16000—17000	Gray
L-5359	Mag.	9375	7 kw	9375±5	Gray	L-4362/8468	Mag.	16,500	60 kw	16000—17000	Gray
L-4553	Mag.	9375	65 kw	9375±30	Gray	L-5330	Mag.	16,500	60 kw	16000—17000	Gray
4J50A	Mag.	9375	225 kw	9375±30	Gray	L-4419	Mag.	16,500	65 kw	16500+125, -90	Gray
4J52A	Mag.	9375	70.0 kw	9375±30	Gray	L-4472	Mag.	16,500	65 kw	16000—17000	Gray
6027	Mag.	9375	18 kw	9375±30	Gray	L-4527	Mag.	16,500	65 kw	16200—16800	Gray
6510	Mag.	9375	65.0 kw	9375±30	Gray	L-5400	Mag.	16,500	65 kw	16500±125	Gray
L-3030	Mag.	9375	300 kw	9375±30	Gray	L-5079	Mag.	16,500	30 kw	16000—17000	Gray
L-3030D	Mag.	9375	330 kw	9375±30	Gray	L-5115	Mag.	16,500	100 kw	16400—16600	Gray
L-3039P	Mag.	9375	225 kw	9375±30	Gray	7208	Mag.	16,500	100 kw	15800—17200	Gray
L-3156	Mag.	9375	112 kw	9375±30	Gray	L-5265	Mag.	16,750	24 kw	16500—17500	Gray
L-3168	Mag.	9375	30.0 kw	9375±30	Gray	L-5223	Mag.	16,750	35 kw	16750±125	Gray
L-3431A	Mag.	9375	18 kw	9375±30	Gray	L-5436	Mag.	16,750	35 kw	16600—16900	Gray
L-3613	Mag.	9375	225 kw	9375±30	Gray	L-4451	Mag.	16,850	35 kw	16600—17100	Gray
L-3635	Mag.	9375	10.0 kw	9375±30	Gray	L-5229	Mag.	16,850	35 kw	16850±125	Gray
L-3654A	Mag.	9375	24 kw	9375±30	Gray	L-4154/7449A	Mag.	24,000	65 kw	24000±100	Gray
L-3890A	Mag.	9375	24 kw	9375±30	Gray	L-4316	Mag.	24,000	25 kw	24000+300, -200	Gray
L-3990	Mag.	9375	24 kw	9375±30	Gray	L-4555	Mag.	32,600	65 kw	32100—33100	Gray
M-4193B/7692	Mag.	9375	200 kw	9200—9550	Gray	L-4558	Mag.	32,600	65 kw	32100—33100	Gray
L-4242	Mag.	9375	15 kw	9375±30	Gray	L-4485	Mag.	33,145	2.0 kw	33070—33220	Gray
L-5047	Mag.	9375	65 kw	9375±30	Gray	L-4296/8366	Mag.	33,200	50 kw	33200±200	Gray
7503	Mag.	9400	100 W	9300—9500	Gray	L-4516	Mag.	34,815	100 kw	34700—34930	Gray
L-3219	Mag.	9400	70 kw	9400±30	Gray	L-4064A	Mag.	34,850	125 kw	34850±150	Gray
L-3039N	Mag.	9400	225 kw	9400±20	Gray	L-4306	Mag.	34,850	110 kw	34700—35000	Gray
L-3036A	Mag.	9410	65.0 kw	9410±5	Gray	7619	Mag.	34,860	40 kw	34860±348	Gray

# Tube Listing by Power Output

Tube Number	Tube Type	Center Frequency (MHz)	Power Output	Frequency Range (MHz)	Section (Color)
L-2333-06	TWT	3000	10 mW	2000—4000	Green
L-2333-08	TWT	3000	10 mW	2000—4000	Green
L-2780	TWTA	3000	10 mW	2000—4000	Green
L-5014	TWT	3000	10 mW	2000—4000	Green
L-2333-11	TWT	3900	10 mW	2600—5200	Green
L-2787	TWTA	3900	10 mW	2600—5200	Green
L-2357-03	TWT	6000	10 mW	4000—8000	Green
L-2357-06	TWT	6000	10 mW	4000—8000	Green
L-2781	TWTA	6000	10 mW	4000—8000	Green
L-5015	TWT	6000	10 mW	4000—8000	Green
L-2357-04	TWT	7500	10 mW	5000—10000	Green
L-2789	TWTA	7500	10 mW	5000—10000	Green
L-2337-14	TWT	9000	10 mW	7000—11000	Green
L-2337-18	TWT	9000	10 mW	7000—11000	Green
L-2782	TWTA	9500	10 mW	7000—12000	Green
L-2337-23	TWT	9700	10 mW	7000—12400	Green
L-2365-01	TWT	12,000	10 mW	8000—16000	Green
L-2798	TWTA	12,000	10 mW	8000—16000	Green
L-2365-03	TWT	15,000	10 mW	12000—18000	Green
L-2797	TWTA	15,000	10 mW	12000—18000	Green
L-5023	TWT	9000	20 mW	7000—11000	Green
6503	Planar	—	25 mW	to 5750	Gray
6BL6	R. Kly.	3950	30-250 mW	1400—6500	Blue
6BM6	R. Kly.	2175	40-170 mW	550—3800	Blue
6BM6A	R. Kly.	2175	40-170 mW	550—3800	Blue
L-5218	TWT	6000	40 mW	4000—8000	Green
L-5045	TWT	9000	1.0 W	7000—11000	Green
2C36	Planar	—	1.0 w	to 4000	Gray
L-2341-08	TWT	7500	1.0 W	500—1000	Green
L-3845	TWT	1500	1.0 w	1000—2000	Green
L-2330-13	TWT	3000	1.0 W	2000—4000	Green
L-2343-03	TWT	3000	1.0 W	2000—4000	Green
L-2783	TWTA	3000	1 W	2000—4000	Green
L-3971	TWT	3000	1.0 W	2400—3600	Green
L-2352-03	TWT	3900	1.0 W	2600—5200	Green
L-2786	TWTA	3900	1 W	2600—5200	Green
L-2335-17	TWT	6000	1.0 W	4000—8000	Green
L-2344-05	TWT	6000	1.0 W	4000—8000	Green
L-2784	TWTA	6000	1 W	4000—8000	Green
L-2335-16	TWT	7500	1.0 W	5000—10000	Green
L-2788	TWTA	7500	1 W	5000—10000	Green
L-2338-20	TWT	9700	1.0 W	7000—12400	Green
L-3972	TWT	9100	1.0 W	8200—10000	Green
L-2345-08	TWT	9700	1.0 W	7000—12400	Green
L-2785	TWTA	9700	1 W	7000—12400	Green
L-5339	TWT	11,000	1 W	8000—14000	Green
L-2364-01	TWT	12,000	1.0 W	8000—16000	Green
L-2366-01	TWT	12,000	1.0 W	8000—16000	Green
L-2795	TWTA	12,000	1 W	8000—16000	Green
L-2364-05	TWT	15,000	1.0 W	12000—18000	Green
L-2366-02	TWT	15,000	1.0 W	12000—18000	Green
L-2796	TWTA	15,000	1 W	12000—18000	Green
2C37	Planar	—	2.0 w	to 3300	Gray
5767	Planar	—	2.0 w	to 3300	Gray
6481	Planar	—	2.0 w	to 3300	Gray
L-2342-03	TWT	1500	2.0 W	1000—2000	Green
L-2347-05	TWT	3000	2.0 W	2000—4000	Green
L-2348-02	TWT	6000	2.0 W	4000—8000	Green
L-3957	TWT	8200	2.0 W	5400—11000	Green
L-3996	TWT	6000	2.0 W	5000—7000	Green
L-3998	TWT	9000	2.0 W	7000—11000	Green
L-5007	TWT	3000	2.0 W	1000—2000	Green
L2345-02	TWT	10,000	2.0 W	8000—12000	Green
L-5008	TWT	10,000	2.0 W	8000—12000	Green
L-5322	TWT	11,000	2 W	8000—14000	Green
L-5227	TWT	15,200	2 W	12400—18000	Green
L-5009	TWT	6000	2.0 W	4000—8000	Green
L-5121	TWT	3950	2.0 W	2600—5300	Green
L-5117	TWT	15,200	3 W	12400—18000	Green
L-2350-01	TWT	3000	5.0 W	2000—4000	Green
L-5154	TWT	8150	5 W	7900—8400	Green
L-2331-07	TWT	1500	10 W	1000—2000	Green

Tube Number	Tube Type	Center Frequency (MHz)	Power Output	Frequency Range (MHz)	Section (Color)
L-2339-03	TWT	1500	10 W	1000—2000	Green
L-5225	TWT	2200	10 W	1700—2700	Green
L-2332-07	TWT	3000	10 W	2000—4000	Green
L-3928	TWT	9000	10 W	7000—11000	Green
L-5010	TWT	3000	10 W	2000—4000	Green
L-5011	TWT	6000	10 W	4000—8000	Green
L-5036	TWT	3000	10 W	2000—4000	Green
L-5043	TWT	9000	10 W	7000—11000	Green
L-5293	TWT	9500	10 W	7000—12000	Green
L-5134	TWT	5100	10 W	3700—6500	Green
L-5380	TWT	8150	15 W	7900—8400	Green
L-5155	TWT	1500	20 W	1000—2000	Green
L-5160	TWT	3000	20 W	2000—4000	Green
L-5083	TWT	6000	20 W	4000—8000	Green
L-5275	TWT	9000	20 W	7000—11000	Green
L-3089B	Mag.	8800	40 w	8800±25	Gray
L-4370	Mag.	13,325	40 W	13325±30	Gray
L-5095	TWT	3000	50 W	2000—4000	Green
7503	Mag.	9400	100 w	9300—9500	Gray
L-3105	Mag.	9300	100 w	9300±40	Gray
L-3500	CW Mag.	470	100 W	350—590	Gray
L-3501	CW Mag.	782	100 W	590—975	Gray
L-5044	ESFK	2300	100 W	2300	Blue
L-5316	MBWO	3050	100 W	2600—3500	Gray
L-5317	MBWO	5450	100 W	4700—6200	Gray
L-5318	MBWO	9000	100 W	8500—9500	Gray
L-3502	CW Mag.	1237	110 W	975—1500	Gray
L-3504A	CW Mag.	2962	110 W	2350—3575	Gray
L-3503A	CW Mag.	1925	110 W	1500—2350	Gray
L-3505A	CW Mag.	4275	110 W	3575—4975	Gray
L-3506A	CW Mag.	5575	110 W	4975—6175	Gray
L-3507A	CW Mag.	6725	110 W	6175—7275	Gray
L-3508A	CW Mag.	8025	110 W	7275—8775	Gray
L-3509A	CW Mag.	9625	110 W	8775—10475	Gray
L-3028D	Mag.	9305	120 w	9280—9330	Gray
L-2786	Mag.	9327	120 w	9315—9340	Gray
L-5104	Mag.	9300	120 w	9290—9310	Gray
L-3728	MBWO	9750	150 W	8500—11000	Gray
L-3726	MBWO	5675	165 W	4800—6550	Gray
L-3714	CW Mag.	600	175 W	475—725	Gray
L-3456	CW Mag.	470	200 W	350—590	Gray
L-3459	CW Mag.	782	200 W	590—975	Gray
L-3721	MBWO	1200	200 W	1000—1400	Gray
L-5323	TWT	3900	200 W	2600—5200	Green
L-5324	TWT	7500	200 W	5000—10000	Green
L-5280	TWT	9000	200 W	7000—11000	Green
L-5383	Mag.	16,250	200 w	16200—16300	Gray
L-5383A	Mag.	16,250	200 w	16200—16300	Gray
L-3724A	MBWO	3025	220 W	2500—3550	Gray
L-3729A	MBWO	5135	220 W	4360—5910	Gray
L-5281	TWT	3000	250 W	2000—4000	Green
L-3463A	CW Mag.	9625	250 W	8775—10475	Gray
L-3462A	CW Mag.	8025	300 W	7275—8775	Gray
L-3468A	CW Mag.	6725	300 W	6175—7275	Gray
L-3798	Mag.	8535	300 w	8520—8550	Gray
L-3461A	CW Mag.	4275	350 W	3575—4975	Gray
L-3464A	CW Mag.	1925	400 W	1500—2350	Gray
L-3465A	CW Mag.	1237	400 W	975—1500	Gray
L-3467A	CW Mag.	5575	400 W	4975—6175	Gray
L-3460A	CW Mag.	2962	500 W	2350—3575	Gray
L-3813	Mag.	9300	500 w	9300±30	Gray
L-5261A	CW Mag.	2450	625 W	2450	Gray
L-5260A	CW Mag.	2450	750 W	2450	Gray
L-5271	Mag.	16,250	800 w	16200—16300	Gray
L-5283	TWT	3000	1 kW	2000—4000	Green
L-5336	TWT	3000	1 kW	2000—4000	Green
L-5320	TWT	3975	1 kW	2650—5300	Green
L-5321	TWT	3975	1 kW	2650—5300	Green
L-5263	TWT	6000	1 kW	4000—8000	Green
L-3225	Mag.	9330	1.0 kw	9310—9350	Gray
L-3379	Mag.	9150	1.0 kw	8800—9500	Gray
L-3496A	Mag.	16,250	1.0 kw	16000—16500	Gray

## TYPE DESIGNATIONS

CFA—Crossed Field Amplifier  
 CW Mag.—Continuous Wave Magnetron  
 ESFK—Electrostatically Focused Klystron

Kly.—Klystron  
 Mag.—Magnetron  
 MBWO—M-type Backward Wave Oscillator

Planar—Planar Triode  
 R. Kly.—Reflex Klystron  
 TWT—Traveling Wave Tube

TWTA—Traveling Wave Tube Amplifier

Tube Number	Tube Type	Center Frequency (MHz)	Power Output	Frequency Range (MHz)	Section (Color)
L-5048	Mag.	16,250	1.0 kw	15950—16550	Gray
L-5089	TWT	9000	1 kw	7000—11000	Green
L-5101	ESFK	2300	1 kW	2300	Blue
L-5126	TWT	9000	1 kw	7000—11000	Green
L-5145	Mag.	9285	1.0 kw	9275—9295	Gray
L-5182	ESFK	4700	1 kW	4400—5000	Blue
L-5189	Mag.	14,200	1.0 kw	14200±150	Gray
L-5001	CW Mag.	2450	1.30 kW	2450	Gray
L-3189	CW Mag.	2450	1.35 kW	2450	Gray
L-3380	Mag.	9150	2.0 kw	8800—9500	Gray
L-4485	Mag.	33,145	2.0 kw	33070—33220	Gray
L-3915	Mag.	16,280	2.2 kw	16260—16300	Gray
L-5113	Mag.	15,550	2.2 kw	15400—15700	Gray
L-5328	Mag.	15,550	2.5 kw	15400—15700	Gray
L-3858	CW Mag.	2450	2.65 kW	2450	Gray
L-5366	TWT	3250	3 kW	3000—3500	Green
L-3381	Mag.	9150	3.0 kw	8800—9500	Gray
L-3382	Mag.	9150	4.0 kw	8800—9500	Gray
L-3645	Mag.	16,200	4.0 kw	16200±100	Gray
L-3844	TWT	425	4 kW	400—450	Green
L-5013	Mag.	16,000	4.0 kw	15500—16500	Gray
L-3956	Mag.	8900	4.5 kw	8900±20	Gray
2J42	Mag.	9375	7 kw	9375±30	Gray
2J42H	Mag.	9375	7 kw	9375±30	Gray
L-5359	Mag.	9375	7 kw	9375±5	Gray
L-5274	Mag.	9345	7.5 kw	9345±20	Gray
L-5035	Mag.	16,150	8.0 kw	15900—16400	Gray
L-3958	Mag.	15,500	9.0 kw	15500±85	Gray
L-3958A	Mag.	15,500	9.0 kw	15500±85	Gray
L-5362	Mag.	9345	10 kw	9345±20	Gray
L-3635	Mag.	9375	10.0 kw	9375±30	Gray
L-5252	TWT	9200	12 kW	8900—9500	Green
L-5209	Mag.	9500	12.5 kw	9200—9800	Gray
L-5248	ESFK	1230	15 kW	1230	Blue
L-4242	Mag.	9375	15 kw	9375±30	Gray
6027	Mag.	9375	18 kw	9375±30	Gray
L-3431A	Mag.	9375	18 kw	9375±30	Gray
L-4264	Mag.	9800	20 kw	9600—10000	Gray
L-3654A	Mag.	9375	24 kw	9375±30	Gray
L-3890A	Mag.	9375	24 kw	9375±30	Gray
L-3990	Mag.	9375	24 kw	9375±30	Gray
L-5265	Mag.	16,750	24 kw	16500—17000	Gray
L-5250	TWT	9450	25 kW	9200—9700	Green
L-5255	TWT	9600	25 kW	9300—9900	Green
L-4316	Mag.	24,000	25 kw	24000+300, -200	Gray
L-5365	Mag.	9345	28 kw	9345±30	Gray
L-3103	Mag.	9050	30.0 kw	8500—9600	Gray
L-3168	Mag.	9375	30.0 kw	9375±30	Gray
L-3668W	ESFK	2780	30 kw	2740—2820	Blue
L-5079	Mag.	16,500	30 kw	16000—17000	Gray
L-5195	ESFK	4455	35 kW	4455	Blue
L-5450	Mag.	16,250	35 kw	16250±25	Gray
L-5200	Mag.	16,500	35 kw	16000—17000	Gray
L-5223	Mag.	16,750	35 kw	16750±125	Gray
L-5436	Mag.	16,750	35 kw	16600—16900	Gray
L-4451	Mag.	16,850	35 kw	16600—17100	Gray
L-5229	Mag.	16,850	35 kw	16850±125	Gray
L-5253	TWT	9750	40 kW	9400—10100	Green
7619	Mag.	34,860	40 kw	34860±348	Gray
L-5371	CFA	—	50-80 kw	X-band	Gray
L-4296/8366	Mag.	33,200	50 kw	33200±200	Gray
L-5049	Mag.	16,475	50 kw	16145—16805	Gray
L-3083A	Mag.	16,500	60 kw	16000—17000	Gray
L-3101A	Mag.	16,500	60 kw	16000—17000	Gray
L-3950	Mag.	16,500	60 kw	16500±100	Gray
L-3987	Mag.	16,500	60 kw	16000—17000	Gray
L-4362/8468	Mag.	16,500	60 kw	16000—17000	Gray
L-5330	Mag.	16,500	60 kw	16000—17000	Gray
6510	Mag.	9375	65.0 kw	9375±30	Gray
6543	Mag.	9050	65.0 kw	8500—9600	Gray
6543A	Mag.	9050	65.0 kw	8500—9600	Gray
L-3036A	Mag.	9410	65.0 kw	9410±5	Gray
L-3036B	Mag.	9275	65.0 kw	9275±15	Gray
L-3036F	Mag.	9245	65.0 kw	9245±30	Gray
L-4553	Mag.	9375	65 kw	9375±30	Gray
L-4154/7449A	Mag.	24,000	65 kw	24000±100	Gray
L-4419	Mag.	16,500	65 kw	16500+125, -90	Gray
L-4472	Mag.	16,500	65 kw	16000—17000	Gray
L-4527	Mag.	16,500	65 kw	16200—16800	Gray
L-5400	Mag.	16,500	65 kw	16500±125	Gray

Tube Number	Tube Type	Center Frequency (MHz)	Power Output	Frequency Range (MHz)	Section (Color)
L-4555	Mag.	32,600	65 kw	32100—33100	Gray
L-4558	Mag.	32,600	65 kw	32100—33100	Gray
L-5047	Mag.	9375	65 kw	9375±30	Gray
4J52A	Mag.	9375	70.0 kw	9375±30	Gray
L-3219	Mag.	9400	70.0 kw	9400±30	Gray
L-3978	Mag.	16,250	70.0 kw	16000—16500	Gray
L-5195	ESFK	4455	75 kW	4455	Blue
L-5407	Mag.	9250	75 kw	9000—9500	Gray
L-5224	Mag.	9300	75 kw	9100—9500	Gray
L-5042	Mag.	16,250	80 kw	16000—16500	Gray
L-5224A	Mag.	9250	85 kw	9000—9500	Gray
L-5333	Mag.	9250	85 kw	9000—9500	Gray
L-4193C	Mag.	9050	90 kw	8500—9600	Gray
L-5273	Mag.	9050	95 kw	8500—9600	Gray
7208	Mag.	16,500	100 kw	15800—17200	Gray
L-3976	Mag.	16,500	100 kw	16500±150	Gray
L-4516	Mag.	34,815	100 kw	34700—34930	Gray
L-5115	Mag.	16,500	100 kw	16400—16600	Gray
L-4306	Mag.	34,850	110 kw	34700—35000	Gray
L-3156	Mag.	9375	112 kw	9375±30	Gray
7208B	Mag.	16,000	125 kw	15500—17500	Gray
L-4064A	Mag.	34,850	125 kw	34850±150	Gray
6344A	Mag.	5637	175 kw	5450—5825	Gray
L-3897	Mag.	5200	175 kw	4950—5450	Gray
7006	Mag.	9300	190 kw	9000—9600	Gray
7111	Mag.	9050	200 kw	8500—9600	Gray
L-4193/7008	Mag.	9050	200 kw	8500—9600	Gray
M-4193B/7692	Mag.	9375	200 kw	9200—9550	Gray
L-4310	Mag.	8950	200 kw	8500—9400	Gray
L-4490	Mag.	9050	200 kw	8500—9600	Gray
L-4469/8855	Mag.	9050	200 kw	8500—9600	Gray
L-4502	Mag.	9050	200 kw	8700—9400	Gray
L-4575	Mag.	9050	200 kw	8500—9600	Gray
L-5149	Mag.	9050	200 kw	8500—9600	Gray
7950	Mag.	9050	208 kw	8500—9600	Gray
4J50A	Mag.	9375	225 kw	9375±30	Gray
L-3039D	Mag.	8800	225 kw	8800±20	Gray
L-3039E	Mag.	8860	225 kw	8860±20	Gray
L-3039F	Mag.	8920	225 kw	8920±20	Gray
L-3039G	Mag.	8980	225 kw	8980±20	Gray
L-3039H	Mag.	9040	225 kw	9040±20	Gray
L-3039I	Mag.	9100	225 kw	9100±20	Gray
L-3039J	Mag.	9160	225 kw	9160±20	Gray
L-3039K	Mag.	9220	225 kw	9220±20	Gray
L-3039L	Mag.	9280	225 kw	9280±20	Gray
L-3039M	Mag.	9340	225 kw	9340±20	Gray
L-3039N	Mag.	9400	225 kw	9400±20	Gray
L-3039P	Mag.	9375	225 kw	9375±30	Gray
L-3039R	Mag.	8790	225 kw	8790±90	Gray
L-3613	Mag.	9375	225 kw	9375±30	Gray
5780	Mag.	9050	250 kw	8500—9600	Gray
7156A	Mag.	5637	250 kw	5450—5825	Gray
7460	Mag.	5637	250 kw	5450—5825	Gray
L-5080	Mag.	5637	250 kw	5450—5825	Gray
L-5235	ESFK	1350	300 kW	1300—1400	Blue
L-5237	ESFK	1350	300 kW	1300—1400	Blue
L-3030	Mag.	9375	300 kw	9375±30	Gray
L-3030B	Mag.	9000	300 kw	9000±30	Gray
L-3030C	Mag.	9200	300 kw	9200±30	Gray
L-3030D	Mag.	9375	330 kw	9375±30	Gray
L-5332	CFA	—	500 kw	S-band	Gray
L-5373	CFA	—	500 kw	S-band	Gray
L-5408	CFA	—	500 kw	C-band	Gray
L-5334	CFA	—	500 kw	X-band	Gray
L-5372	CFA	—	500 kw	X-band	Gray
L-3742	Kly.	3040	1.0 Mw	2980—3100	Blue
L-3975	ESFK	3080	1 Mw	3080	Blue
L-3403	Kly.	425	1.25 Mw	400—450	Blue
L-3694	Kly.	425	1.25 Mw	400—450	Blue
L-5120	Kly.	805	1.25 Mw	805	Blue
L-3035	Kly.	1300	2.2 Mw	1240—1360	Blue
L-5096	Kly.	1500	2.2 Mw	1450—1550	Blue
L-3843	Kly.	2855	5.0 Mw	2855	Blue
L-3943	Kly.	1300	5 Mw	1295—1305	Blue
L-3250	Kly.	1300	10 Mw	1250—1350	Blue
L-3660	Kly.	1300	10 Mw	1295—1305	Blue
L-3944	Kly.	1300	10 Mw	1295—1305	Blue
L-3661	Kly.	1300	20 Mw	1290—1310	Blue
L-5081	Kly.	1300	30 Mw	1295—1305	Blue



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.



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.

**CAUTION**



**X-RAYS**

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.

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