RCA
TRAVELING-WAVE TUBE
CLASSIFICATION CHARTS

MICROWAVE DEVICES

RADIO CORPORATION OF AMERICA
ELECTRONIC COMPONENTS & DEVICES, HARRISON, N. J. 07029

MWD-101C 11-67
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RCA TRAVELING-WAVE TUBES

RCA Traveling-Wave Tube capability represents experience acquired during 17 years of TWT tube development and manufacture. Whether providing a standard product or one customized for your application, the RCA trademark assures high quality and reliability. Our application and system engineering groups are available to help define requirements for your system. In addition, the RCA approach includes engineering follow-up that continues beyond the test set until customer satisfaction is assured through in-system tube performance.

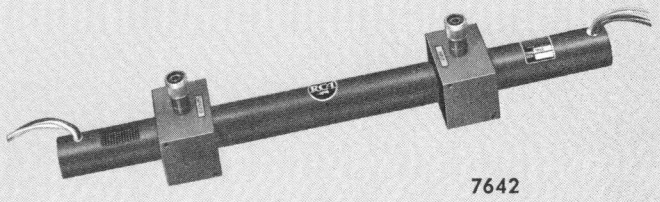
MAJOR APPLICATION AREAS FOR RCA TWT'S

■ **MILITARY SYSTEMS:** Low- and medium-power TWT's for military system applications such as radar receivers, electronic countermeasures and guidance systems • Specialized tubes for use as limiters, switches, memory storage, and for applications requiring matched-gain characteristics also available • Heavily ruggedized designs for most critical service environments • Noise figures below 10 dB in ppm-focused tubes • Ultra-low noise figures (3-5 dB) in solenoid-focused tubes • Tubes covering more than an octave frequency band • Integral all-solid-state power supplies are available (TWT's are replaceable) – and most important of all, years of field experience in customizing our TWT's to fit your system requirements.

■ **SPACE COMMUNICATION SYSTEMS:** Ten years of experience in high reliability, long-life tubes • Participation in many satellite systems including achievement of longest TWT operating life in orbit of any space qualified tube • Some types have MTBF's of 10 years with 95% confidence • Efficiencies, including heater, of over 40%, power from 5 to 40 watts CW • Complete transponder units including TWT, solid-state signal source, varactor multipliers, power supplies, etc., also available.

■ **GROUND COMMUNICATION SYSTEMS:** Years of experience in providing long life, up to 10,000 hours on some types • TWT's for applications in point-to-point microwave relay as well as for troposcatter communication systems • Excellent hot match (i.e., good VSWR when tube is operating) • CW powers at all levels up to 25 watts • Tubes available with all solid-state power supplies, protective circuitry, and metering circuits if desired.

8379



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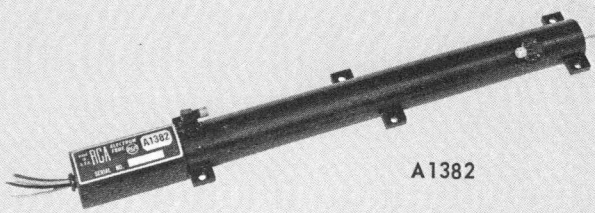
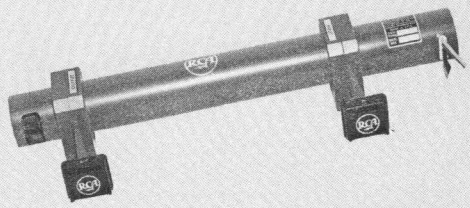
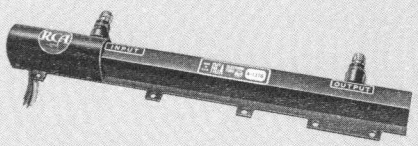


A1382



A1225



A1318

J2027

J2028B

CLASSIFICATION CHART

LOW-NOISE TWT'S – Focusing: Solenoid

RCA Type[a]	CHARACTERISTICS										PACKAGE		
						Heater		Collector			Dimensions[d]		
	Environment[b]	Frequency Range[c]	RF Output *Min.*	Gain (Small Signal) *Min.*	Noise Fig. *Max.*	Voltage *Typ.*	Current *Typ.*	Voltage *Typ.*	Current *Typ.*	Control Grid	Clearance (Includes Conn.) *Max.* in	Capsule *Nominal* in	Weight Approx.
		GHz	mW	dB	dB	V	A	V	mA		L	Dia.	lb
A1217	Ground	1.1-1.4	0.5	20	5	5	0.65	600	0.15	Yes	19.4	1.38	1.5
A1056V2	Ground	1.25-1.35	0.25	20	4.5	5	0.70	600	0.27	Yes	19.4	1.38	1.5
A1217V4	Ground	1.7-1.94	0.5	25	5	5	0.65	600	0.15	Yes	19.6	1.39*	1.5
A1078V10	Ground	2.09-2.41	0.25	20	8	5	0.65	400	0.15	Yes	19.6	1.39*	1.5
A1207V26	Ground	2.19-2.31	1.0	20	5	5	0.65	800	0.15	Yes	19.6	1.39*	1.5
8379	Ground	2.32-2.68	1.0	28	5	5	0.65	600	0.15	Yes	19.5	1.39*	1.5
A1078V1	Ground	2.5-4	0.25	20	8	5	0.65	400	0.15	Yes	19.6	1.39*	1.5
6861	Ground	2.7-3.5	0.25	20	7	5	0.65	400	0.15	Yes	19.6	1.39*	1.5
A1207V17	Ground	2.7-3.5	1.0	20	5	5	0.65	800	0.15	Yes	19.6	1.39*	1.5
A1207V29	Ground	3.5-4	1.0	25	5	5	0.65	800	0.15	Yes	19.6	1.39*	1.5

INTERMEDIATE-NOISE TWT'S – Focusing: Periodic-Permanent-Magnet

RCA Type[a]	CHARACTERISTICS										PACKAGE				
						Heater		Collector			Dimensions[d]				
	Environment[b]	Frequency Range[c]	RF Output *Min.*	Gain (Small Signal) *Min.*	Noise Fig. *Max.*	Voltage *Typ.*	Current *Typ.*	Voltage *Typ.*	Current *Typ.*	Control Grid	Clearance (Includes Conn.) *Max.* in			Capsule *Nominal* in	Weight Approx.
		GHz	mW	dB	dB	V	A	V	mA		L	W	H	Dia.	lb
A1350V1	Airborne	0.8-1.6	10	30	13	6.3	0.2	500	1.5	Yes	18	2.5	2.94	1.25	4
A1294	Airborne	1-2	10	35	12	6.3	0.2	500	1.5	Yes	17	2	2	1.25	4
A1350	Airborne	1-2.6	10	30	12	6.3	0.2	500	1.5	Yes	18	2.5	2.94	1.25	4
A1327	Airborne	2-4	10	36	17	6.3	0.2	450	3.0	No	12.3	1.58	1.56	1.50*	2
4017	Airborne	2-4	10	30	16	6.3	0.6	500	1.0	Yes	16	1.62	2.94	1.06	3
A1200V3	Ground	2-4	10	31	16	6.3	3.0	500	1.0	Yes	16	1.62	3.5	1.06	3.5
A1295	Airborne	2-4	10	35	13	6.3	0.6	500	1.0	Yes	15	2	2	1.25	3
4020	Airborne	4-7	10	28	18	6.3	0.6	900	0.8	Yes	16	1.62	2.94	1.06	3
A1360[e]	Airborne	4-8	10	30	17	6.3	0.22	900	2.5	No	12	1.5	1.5	1.03*	1.8
A1304[e]	Airborne	7-11	10	30	10	6.3	0.22	1200	0.75	Yes	12.7	3.98	2.0	1.81	4
A1375	Airborne	2-6[h]	10	38	17	6.3	0.19	800	4.0	Yes	12.9	1.57	1.72	1.06	3
A1383[e]	Airborne	7.5-12	5	30	20	6.3	0.2	1050	0.5	Yes	12	1.5	1.5	1.03	1.6

LOW-POWER TWT'S – Focusing: Periodic-Permanent-Magnet

RCA Type[a]	CHARACTERISTICS									PACKAGE				
					Heater		Collector			Dimensions[d]				
	Environment[b]	Frequency Range[c]	RF Output *Min.*	Gain (Small Signal) *Min.*	Voltage *Typ.*	Current *Typ.*	Voltage *Typ.*	Current *Typ.*	Control Grid	Clearance (Includes Conn.) *Max.* in			Capsule *Nominal* in	Weight Approx.
		GHz	W	dB	V	A	V	mA		L	W	H	Dia.	lb
A1268	Ground	1-2	0.1	25	6.3	1.35	600	6	No	14.5	1.75	1.5	1.5	1.75
A1308[f]	Airborne	1.5-4.5	0.01	33	6.3	0.7	500	4	No	12	1.75	1.5	1.06	1.75
A1313[g]	Airborne	2-4	0.01 0.005	15 30	6.3	0.7	500	3.5	No	12	1.75	1.5	1.06	1.75
A1297	Airborne	2.5-3.5	0.005	14	6.3	0.7	500	4	No	6.5	2.125	1.5	1.06	0.94
A1322	Airborne	2-6[h]	0.01	35	6.3	0.7	780	4.5	No	12.9	1.57	1.72	1.06	1.8
A1372[e]	Airborne	2-4	0.018	32	6.3	1.3	700	4	Yes	14	2.04	1.69	1.25	2.8
A1374[e]	Airborne	2-4	0.008	14-17	6.3	0.9	500	5	Yes	6.75	2.12	1.25	1.06	1
A1113V8	Airborne	2.7-3.5	0.1	30	6.3	1.3	700	8	Yes	15.6	1.75	2.5	1	2.5
A1382[e]	Airborne	4-7.5	0.003	30	6.3	0.2	650	0.3	Yes	12	1.5	1.5	1.03*	1.6
A1385[e]	Airborne	4-7.5	0.1	41	6.3	0.2	1050	8	No	13	1.25	1.25	0.95	1.6
A1361	Airborne	4-8	0.01	30	6.3	0.8	900	2.5	Yes	12	1.51	1.55	1.07	1.8
A1351[e,g]	Airborne	7-11	0.01 0.005	40 20	6.3	0.25	1380	0.8	Yes	15.3	2.25	2.25	1.78	3
A1383[e]	Airborne	7.5-12	0.005	30	6.3	0.2	1050	0.5	Yes	12	1.5	1.5	1.03*	1.6
A1386[e]	Airborne	7.5-12	0.2	40	6.3	0.2	1950	12	No	13.1	1.25	1.25	0.95	1.6
A1215	Ground	12-18	0.01	30	6.3	0.85	2200	3	Yes	14.4	4.62	1.5	1.50	3.75

*Max.

INTERMEDIATE-POWER TWT's – Focusing: Periodic-Permanent-Magnet

RCA Type[a]	CHARACTERISTICS									PACKAGE				
					Heater		Collector			Dimensions[d]				
	Environment[b]	Frequency Range[c]	RF Output *Min.*	Gain (Small Signal) *Min.*	Voltage *Typ.*	Current *Typ.*	Voltage *Typ.*	Current *Typ.*	Control Grid	Clearance (Includes Conn.) *Max.* in			Capsule *Nominal* in	Weight Approx.
		GHz	W	dB	V	A	V	mA		L	W	H	Dia.	lb
A1317	Ground	0.75-1	20	30	6.3	0.95	1650	55	No	20	2.19	2.12	1.62	5
4021	Airborne	1-2	1	27	6.3	1.85	900	25	Yes	15.6	1.52	2.5	1.52	4.5
4053[i]	Ground	1-2	10	25	6.3	1.75	2200	70	Yes	20.5	3.12	3.88	1.62*	6.5
7642[i]	Ground	1.7-2.3	18	28	6.3	1.75	2000	70	No	20.5	3.12	3.88	1.62*	6.5
4054[i]	Ground	1.7-2.7	17	29	6.3	1.75	2200	70	Yes	19	2.12	3.88	1.62*	6.5
A1309	Airborne	1.9-4.1	1	35	6.3	1.4	1100	30	No	13	1.76	1.75	1.25	2.5
A1311	Airborne	1.9-4.1	1	35	6.3	1.3	1100	35	Yes	15.5	1.94	1.84	1.25	2.5
A1201V1	Airborne	2-4	1	30	6.3	1.3	1145	20	Yes	15.4	2.03	3.34	1.06	3
A1138V1	Airborne	2-4	2	38	6.3	1.3	1250	20	Yes	15.5	2.03	1.62	1.06	3
A1314	Airborne	2-4	2	33	6.3	1.5	1150	35	No	13	1.76	1.75	1.25*	2.5
A1312[e]	Airborne	2-4	5	30	5.0	0.5	800	30	No	13	2.72	1.30	1.25	1.5
A1320[e]	Space	2-4	20	30	5.0	0.5	1000	38	No	9.5	2.72	1.30	1.25	1.6
4056[e]	Space	2.2-3	13	35 sat.	5.0	0.5	1000	38	No	13	2.72	1.30	1.25	1.6
A1318[e]	Space	2.5-4.5	5-45[k]	40 sat.	5.0	0.5	800-1400[k]	20-70	No	12	2.72	1.30	1.25	1.5
A1310	Airborne	2-6[h]	3	35	6.3	1.35	1100	30	No	15.4	1.94	2.00	1.25	3.25
A1323	Airborne	2-6[h]	2	33	6.3	1.35	1600	30	No	15.8	1.86	2.45	1.25*	3.3
A1205	Airborne	4.4-5	1	37	6.3	1.35	1600	27	No	15.6	1.88	2.42	1.12*	3.25
A1359[e]	Airborne	4.4-5	15	30	5.0	0.52	1050	40	No	13	1.5	1.8	0.76	7
A1358	Airborne	5.8-6.4	3	35	6.3	1.35	1500	27	No	15.2	1.94	2.0	1.25*	3.3
A1203	Airborne	7.5-11	1	32	6.3	0.85	2950	12	No	15.2	3.81	2.69	1.75	6
4041	Airborne	8-12	1	32	6.3	0.85	3000	12	Yes	15	2.2	3.25	1.75	6
A1225	Ground	12-18	1	30	6.3	0.85	4100	15	Yes	13	4.62	2.69	1.75	6

PULSE TWT'S – Focusing: Periodic-Permanent-Magnet

RCA Type[a]	CHARACTERISTICS										PACKAGE				
						Heater		Collector			Dimensions[d]				
	Environment[b]	Frequency Range[c]	RF Output *Min.*	Duty Factor	Gain (Small Signal) *Min.*	Voltage *Typ.*	Current *Typ.*	Voltage *Typ.*	Current *Typ.*	Control Grid	Clearance (Includes Conn.) *Max.* in			Capsule *Nominal* in	Weight Approx.
		GHz	W		dB	V	A	V	mA		L	W	H	Dia.	lb
A1316	Ground	2-4	100	0.1	28	6.3	2.5	3500	30	Yes	19.8	3.53	4.59	2.5	12.5
A1181	Airborne	7.5-11.2	25	0.05	27	6.3	1.25	6500	5.5	Yes	14.1	3.78	2.41	1.75	6
A1181V2	Airborne	8-11	3	0.05	30	6.3	1.3	6500	5	Yes	14.1	3.72	3.97	1.75	6

*Max.

FOOTNOTES

[a] Type numbers with prefix A and J are developmental types. These developmental-type devices are suitable for engineering evaluation. The type designations and data are subject to change. Unless otherwise arranged, no obligations are assumed for notice of change or future manufacture of these devices.

Type numbers with suffix V are variants of the prototype.

Inquiries are invited about new types or variants of prototypes for specific equipment designs. Application assistance is readily available.

[b] Details on applicable environmental specifications are available on request. Inquiries are invited on types to meet specific environmental requirements.

[c] When ordering traveling-wave tubes, specify the frequency range in which operation is intended.

[d] **Capsule nominal diameter** is the diameter of the longest cylinder. For the "U" shaped capsule, capsule nominal diameter is the width of the "U" (flange dimension excluded).

[e] Ceramic-Metal Construction.

[f] Available with integral power supply as type J2027. Dimensions – 12" x 3.25" x 1.62".

[g] This tube has two output couplers.

[h] Can be supplied to cover any octave band within this range.

[i] Available with integral power supply in instrument-type cabinet such as J2028 series.

[k] Power output varies with collector current; efficiency remains constant.