

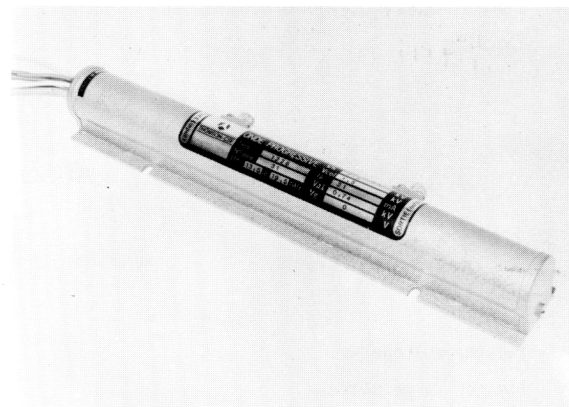


## TH 3522 TRAVELING WAVE TUBE

The TH 3522 is a medium-power, traveling wave tube designed for microwave radio-link applications. Operating in C band, in the range 5.9 to 7.2 GHz, it delivers more than 7 watts of CW power at the output with minimum gain equal to 30 dB.

A periodic permanent magnet beam-focusing assembly is an integral part of the TH 3522. This compact and lightweight TWT is cooled by conduction alone.

The TH 3522 TWT is used in the TH 20034, a lightweight, compact, adjustment-free microwave amplifier. Of sturdy construction, it is intended for use in airborne and other mobile equipment, and in microwave radio links.



### GENERAL CHARACTERISTICS

#### Electrical

Frequency range . . . . .	5.9 to 7.2	GHz
Output power, min. . . . .	7	W
Gain at rated power, min. . . . .	30	dB
Gain ripple, max. . . . .	± 0.5	dB
Gain slope, max. . . . .	± 0.02	dB/MHz
Efficiency, min. . . . .	16	%
Noise figure, max. . . . .	28	dB
Output hot VSWR, max. . . . .	2.5 : 1	
AM/PM conversion, max. . . . .	4	°/dB
Heater current . . . . .	0.3 - 0.6	A
Anode voltage . . . . .	0.6 - 1.2	kV
Helix voltage . . . . .	2.7 - 3.2	kV
Collector voltage . . . . .	1.3 - 1.55	kV
Collector current, max. . . . .	28	mA



**Mechanical**

Operating position . . . . .	Any
Dimensions . . . . .	See outline drawing
Weight (approx.) . . . . .	650 g
RF connections . . . . .	OSM 206/1
Power-supply connections . . . . .	Flying leads
Cooling . . . . .	By conduction

**ABSOLUTE RATINGS**

(non-simultaneous)

	Min.	Max.	Units
Heater voltage . . . . .	6.0	6.6	V
Heater surge current . . . . .	-	1.2	A
Warm-up time . . . . .	3	-	mn
Anode voltage . . . . .	-	$V_a$ (nom) +200	V
Anode current . . . . .	-	2	mA
Drive power . . . . .	-	50	mW
Helix voltage (1) . . . . .	$V_h$ -250	$V_h$ +250	V
Helix current . . . . .	-	2	mA
Collector voltage (2) . . . . .	$V_c$ -200	$V_c$ +200	V
Collector current . . . . .	-	28	mA
Collector dissipation . . . . .	-	45	W
Ambient temperature . . . . .	-10	+120	°C
Load VSWR . . . . .	-	2.5 : 1	

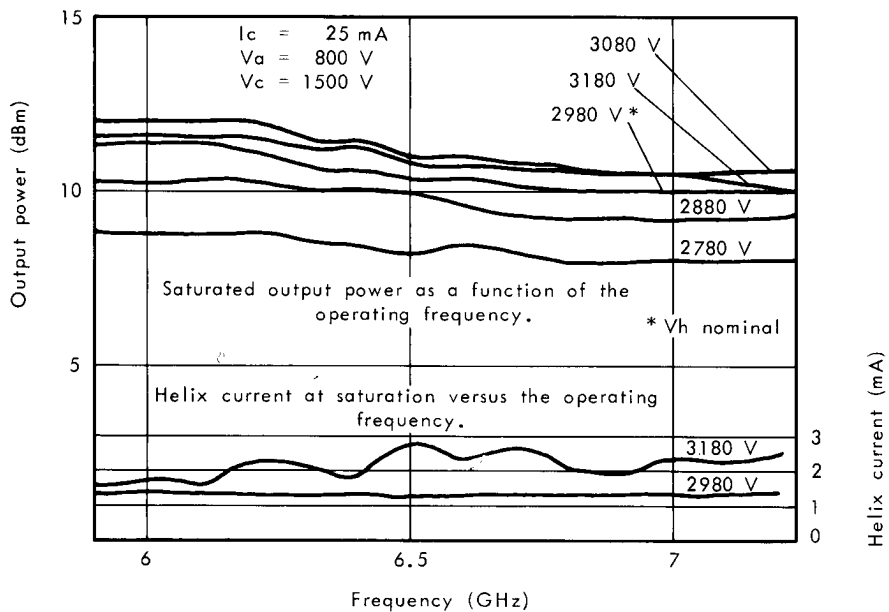
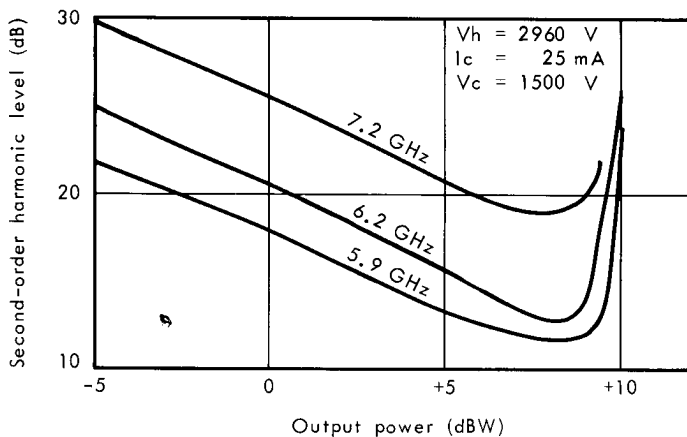
- (1)  $V_h$  = nominal helix voltage, as per each tube's data sheet.
- (2)  $V_c$  = nominal collector voltage, as per each tube's data sheet.

**TYPICAL OPERATION**

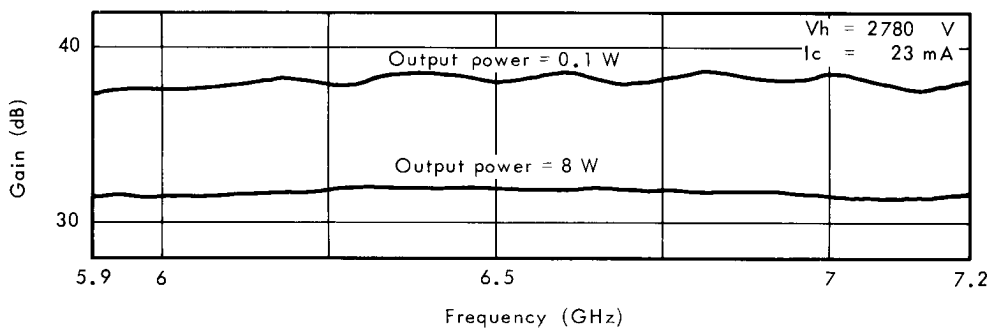
Frequency . . . . .	6.7	GHz
Output power . . . . .	9.2	W
Input power . . . . .	5.2	mW
Gain . . . . .	32.5	dB
Heater voltage . . . . .	6.3	V
Heater current . . . . .	0.42	A
Cathode current . . . . .	25	mA
Anode voltage . . . . .	810	V
Anode current . . . . .	0	mA
Helix voltage . . . . .	2.86	kV
Helix current . . . . .	0.70	mA
Collector voltage . . . . .	1.5	kV



Second-order harmonics versus output power

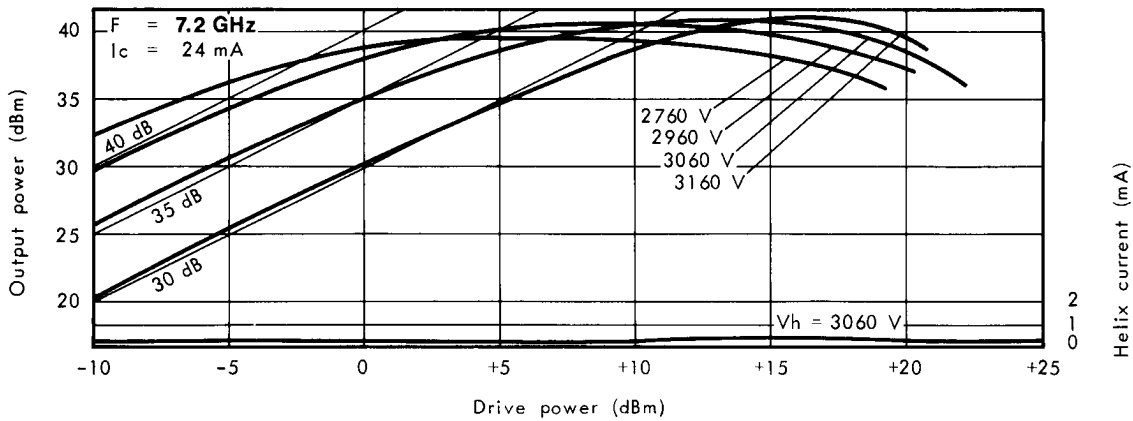
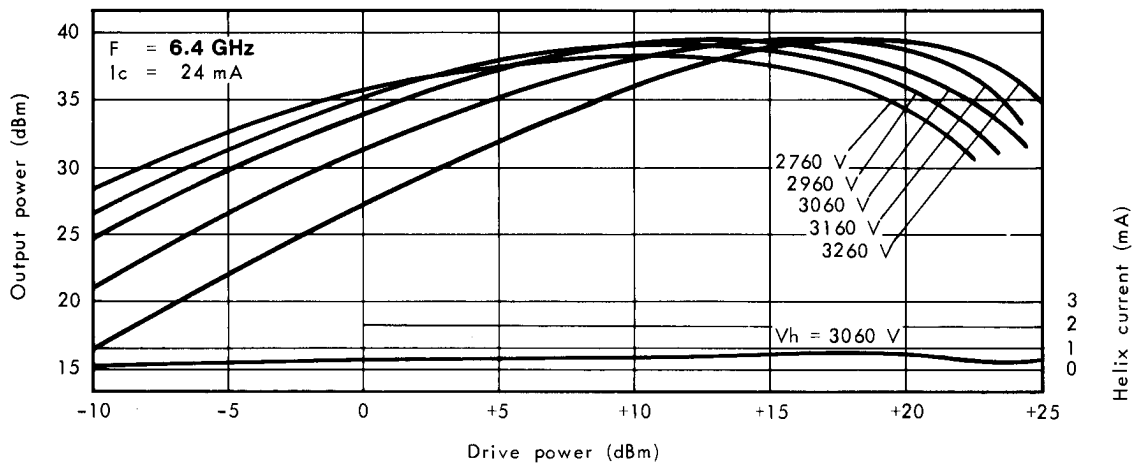
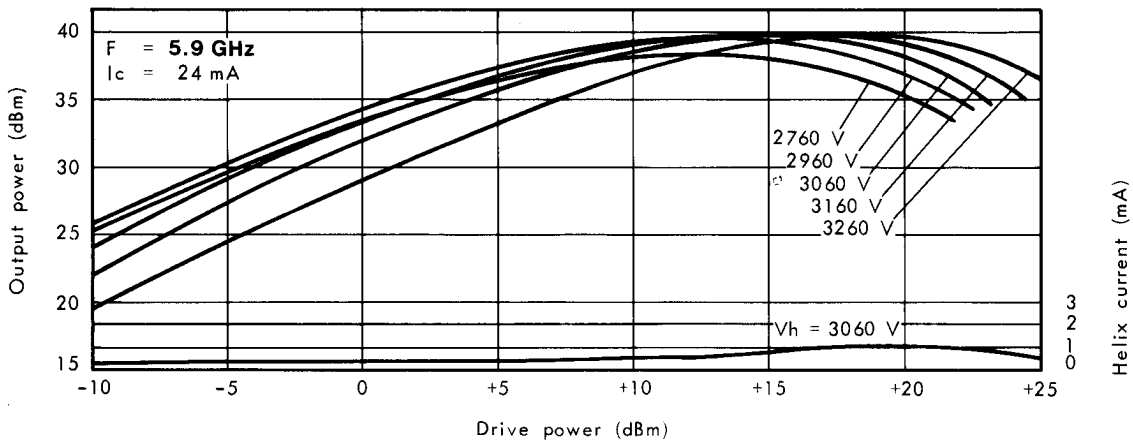


Gain flatness at two different output-power levels.



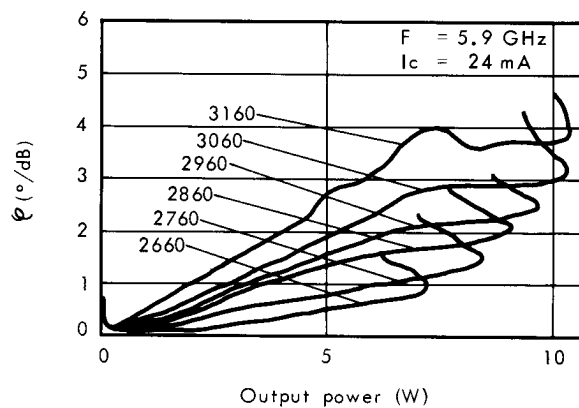
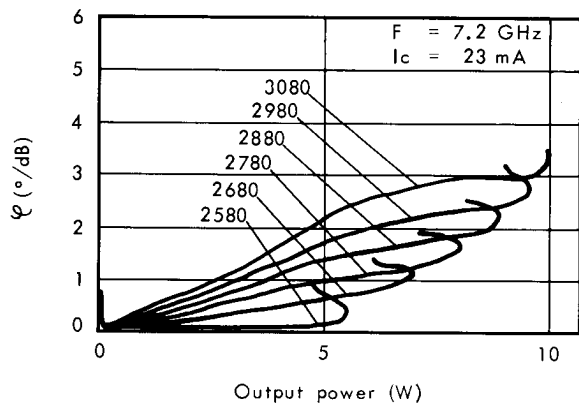


OUTPUT POWER AND HELIX CURRENT  
AS A FUNCTION OF DRIVE POWER,  
WITH A CONSTANT HELIX VOLTAGE

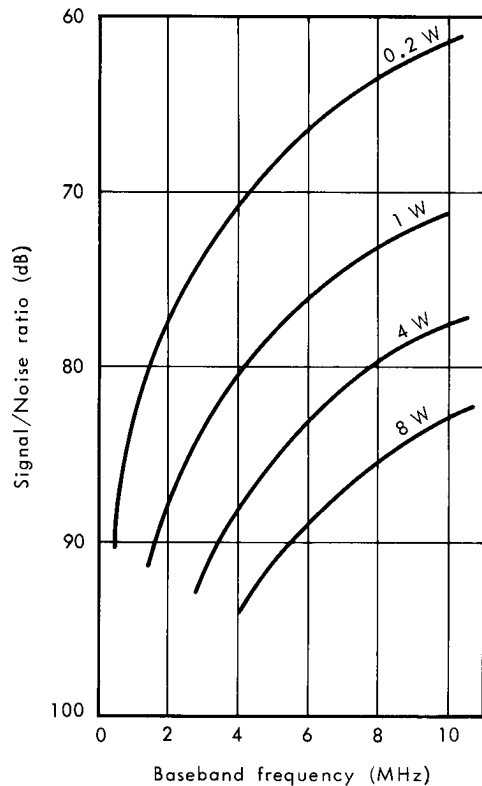




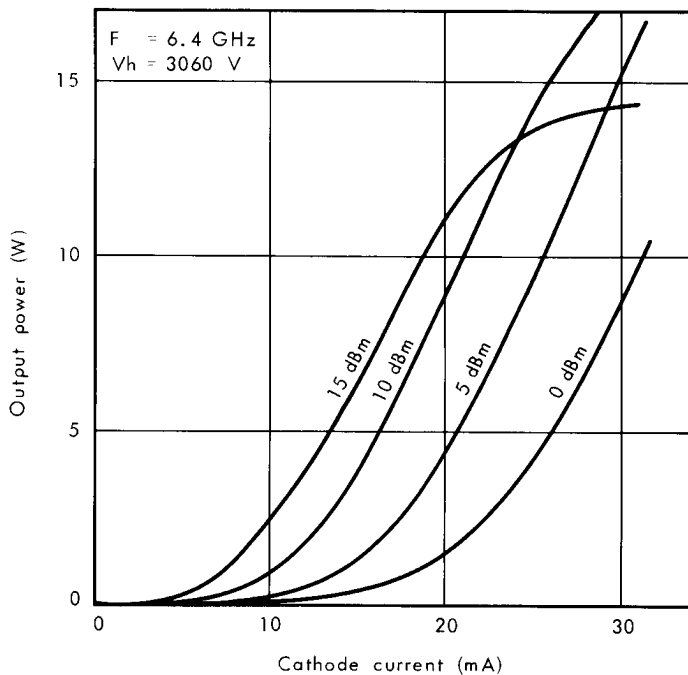
AM/PM CONVERSION ( $\varphi$ )



FM Signal-to-noise ratio  
(carrier frequency = 6 GHz) in a 4-kHz  
window as a function of the baseband frequency

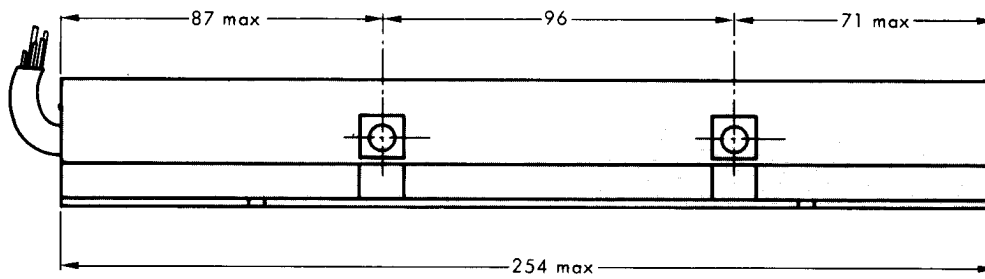
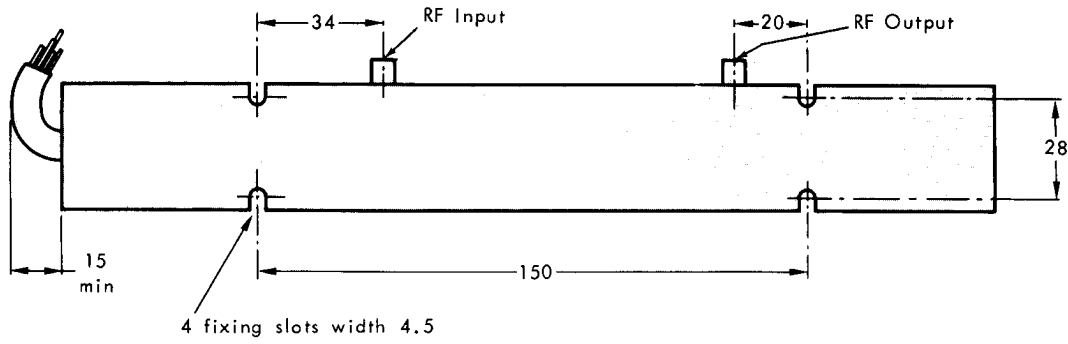


Output power as a function of the cathode current,  
with a constant drive-power level.



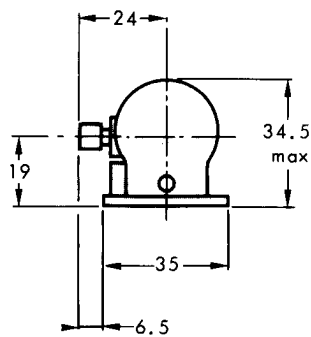


**OUTLINE DRAWING**



Note - The minimum length of the flying leads is:

- for the TWT supply = 350 mm
- for the thermal protection ("Vigitherme") = 450



LEADS IDENTIFICATION	
Brown	Heater cathode
Yellow	Cathode
Green	Wehnelt
Blue	Anode
Red	Collector
Orange	Helix Ground
Grey	"Vigitherme"
White	"Vigitherme" (isolated)

All dimensions nominal (except limiting values), in mm.

