to fixed installations.

The conventional magnetron is small and cheap, and is extensively used in many types of equipment. There is a wide range of spectra produced by conventional magnetrons, compare the spectra of Figure 2a and 2b, for example. This may be because conventional magnetrons are subject to wide variations in equipment design and operational maintenance. When the conventional magnetron is combined with narrowband filters or diplexers, as in the GPN-20, excellent spectrum characteristics are possible.

The coaxial magnetron produces a cleaner spectrum (near center frequency) than the conventional magnetron, completely eliminating the "porch" which is present with conventional magnetrons. Farther away in frequency, however, the improvement is not particularly noticeable. A "hump" about 100 MHz above the fundamental frequency is present in many coaxial magnetron spectra. Whether the [1, 2, 1] mode "hump" of a coaxial magnetron spectrum is more objectionable than the frequency pulling "porch" (produced by conventional magnetrons) is a matter of question.

The spectrum used by various combinations of output tubes and bandpass filters is one factor in determining how much value is gained from the spectrum allocated to radar. Many factors besides the level of unnecessary sidebands must obviously be included in the choice of radar output tubes. However, the difference between the amount of spectra used by various tube types is very substantial and must not be totally ignored. A majority of the frequency spectrum allocated to radar is currently filled by unnecessary spurious sidebands produced by dirty radar output tube technology. The widespread use of cleaner output tube technology would provide room for many more radars in existing bands.

9. REFERENCES

NTIA (1980), Manual. of Regulations and Procedures for Federal Radio Channel Frequency Management, Revised Edition, Chapter 5, January.

Hinkle, R. L., R. M. Pratt, and R. J. Matheson (1976), Spectrum resource assessment in the 2.7 to 2.9 GHz band phase II: measurements and model validation (Report No. 1), OT Report 76-97.

Hinkle, R. L. (1980), Spectrum resource assessment in the 2.7 to 2.9 GHz band phase II: LSR deployment in the Los Angeles and San Francisco areas (Report No. 3), NTIA Report 80-38.

Matheson, R. J. (1977), A radio spectrum measurement system for frequency management data, IEEE Transactions, Electromagnetic Compatibility, EMC-19, No. 3, pp. 225-230.