

## CHARACTERIZATION OF THE UNBOUNDED BICOMMUTANT OF $C_0(N)$ CONTRACTIONS

R. T. W. MARTIN

*Abstract.* Recent results have shown that any closed operator  $A$  commuting with the backwards shift  $S^*$  restricted to  $K_u^2 := H^2 \ominus uH^2$ , where  $u$  is an inner function, can be realized as a Nevanlinna function of  $S_u^* := S^*|_{K_u^2}$ ,  $A = \varphi(S_u^*)$ , where  $\varphi$  belongs to a certain class of Nevanlinna functions which depend on  $u$ . In this paper this is generalized to show that given any contraction  $T$  of class  $C_0(N)$ , that any closed (and not necessarily bounded) operator  $A$  commuting with the commutant of  $T$  is equal to  $\varphi(T)$  where  $\varphi$  belongs to a certain class of Nevanlinna functions which depend on the minimal inner function  $m_T$  of  $T$ .

*Mathematics subject classification (2000):* 47A45, 47A50..

*Keywords and phrases:* contractions of class  $C_0(N)$ ; unbounded double commutant;  $H^\infty$  functional calculus.

### REFERENCES

- [1] D. SARASON, *Unbounded operators commuting with restricted backwards shifts*, Oper. Matrices, **2** (2008), 583–601.
- [2] D. SUÁREZ, *Closed commutants of the backwards shift operator*, Pacific J. Math., **179** (1997), 371–396.
- [3] D. SARASON, *Generalized interpolation in  $H^\infty$* , Trans. Amer. Math. Soc., **127** (1967), 768–770.
- [4] B. SZ.-NAGY AND C. FOIAŞ, *Modèle de Jordan pour une classe d'opérateurs de l'espace de Hilbert*, Acta Sci. Math., **31** (1970), 91–115.
- [5] B. SZ.-NAGY AND C. FOIAŞ, *Vecteurs cycliques et quasi-affinités*, Studia Math., **31** (1968), 35–42.
- [6] B. SZ.-NAGY AND C. FOIAŞ, *Harmonic analysis of operators on Hilbert space*, American Elsevier publishing company, Inc., New York, N.Y., 1970.