

RB-FB/lmg

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**ENSEMBLE DES EQUIPEMENTS RF BAS NIVEAU DE LA
MACHINE LEAR VIA LES SCHEMAS FONCTIONNELS**

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F. Blas

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INTRODUCTION

L'objectif de cette note est de grouper l'ensemble des synoptiques des unités électroniques du système de contrôle de faisceau du LEAR. Ces schémas sont dérivés des dessins électriques et ont été repris*) de façon à ne retenir que les fonctions essentielles de ces différentes unités.

Cette approche doit permettre un diagnostic rapide en cas de problème pendant le fonctionnement normal et au cours des séances de développement machine.

Le lecteur pourra utilement se reporter au schéma-bloc PS-RF-LL-1005/SY qui présente les interconnexions de ces mêmes unités dans leur contexte global.

*) Pour certaines unités électroniques, dont le schéma bloc avait été publié dans le passé, les modifications ont consisté à la reprise des symboles afin de satisfaire le standard choisi pour ce document.

PRINCIPAUX SYMBOLES



: MIXER OU MULTIPLIEUR OU MODULATEUR



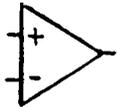
: SOMMATEUR



: INTEGRATEUR



: DERIVATEUR



: COMPAREUR



: AMPLIFICATEUR OU BUFFER DE GAIN X (OPTION)



: DISCRIMINATEUR DE PHASE



: DEPHASEUR PUR DE α DEGRES



: FILTRE PASSE BANDE



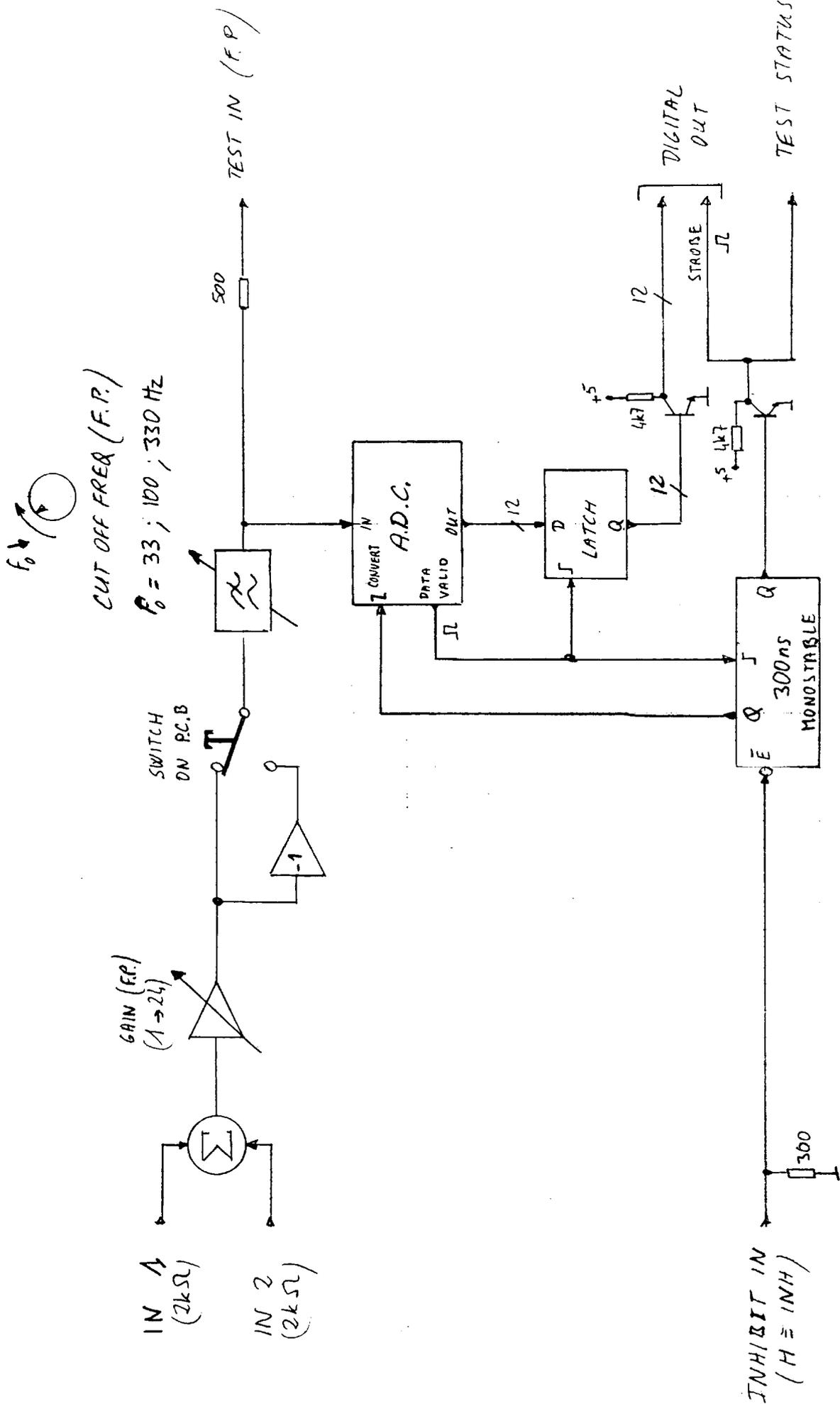
: FILTRE COUPE BANDE



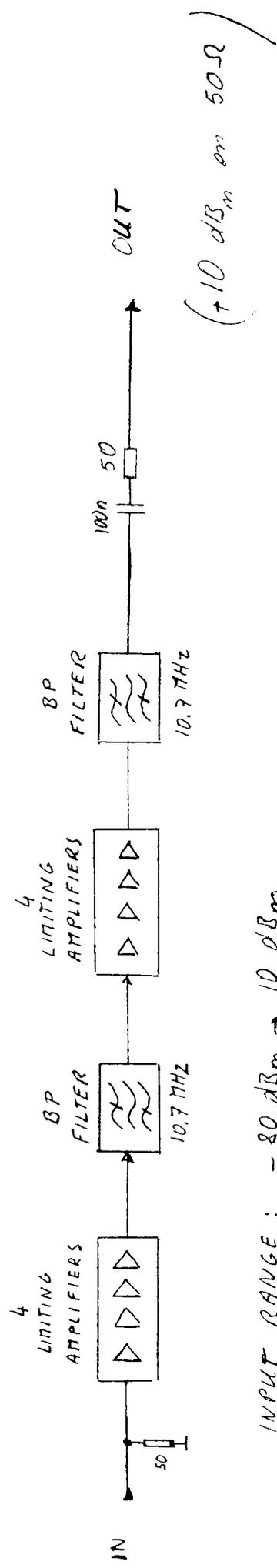
: FILTRE PASSE BAS



: FILTRE PASSE HAUT

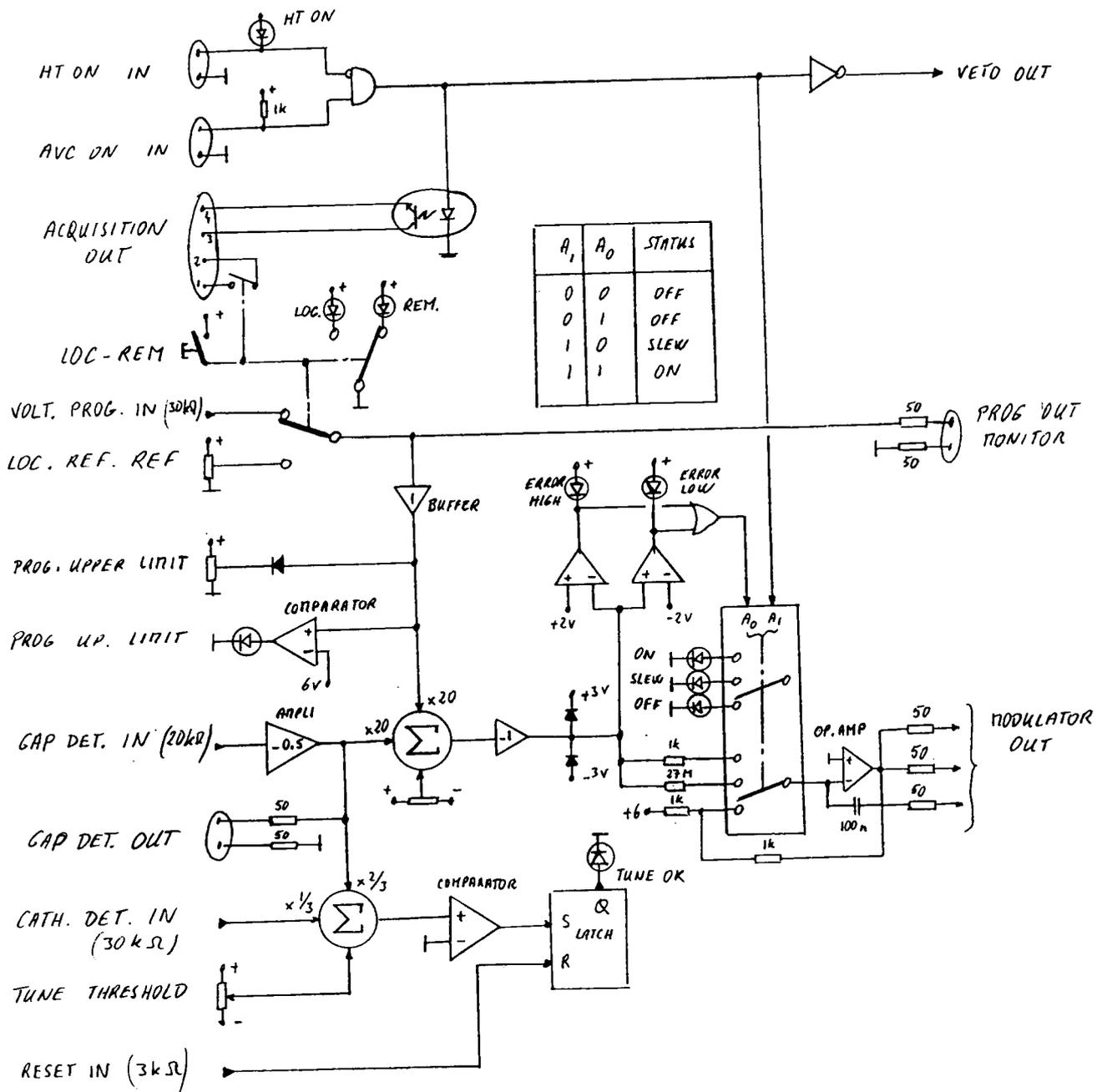


ADC POSITION CONTROL LOOP

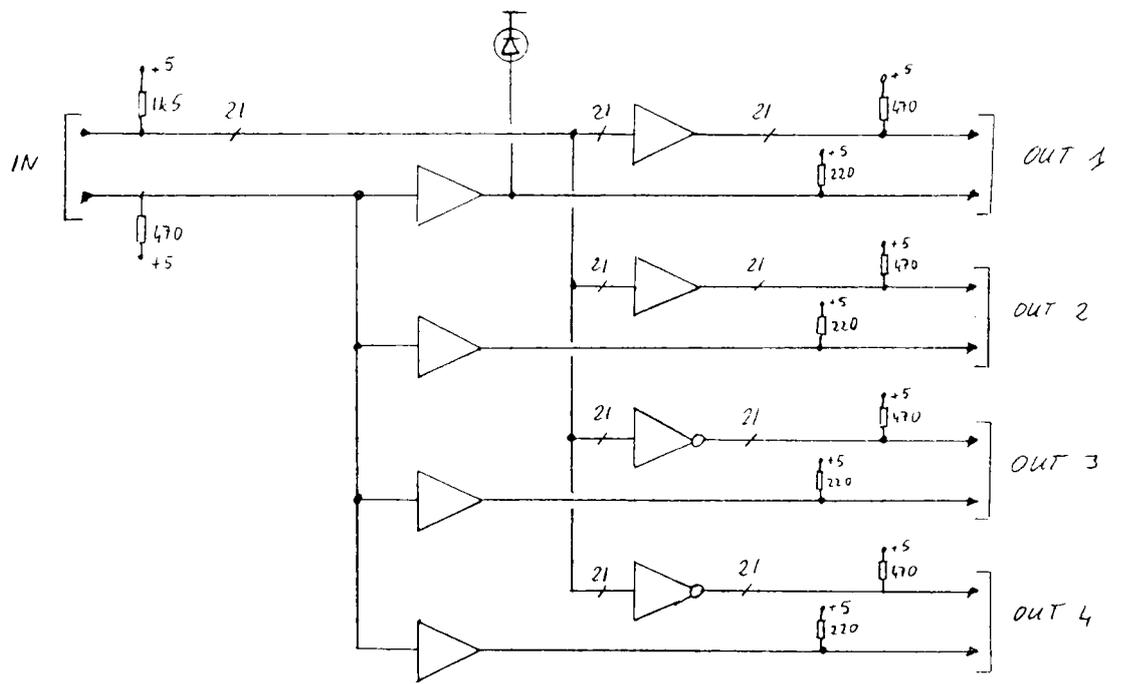


INPUT RANGE : -80 dB_m → 10 dB_m

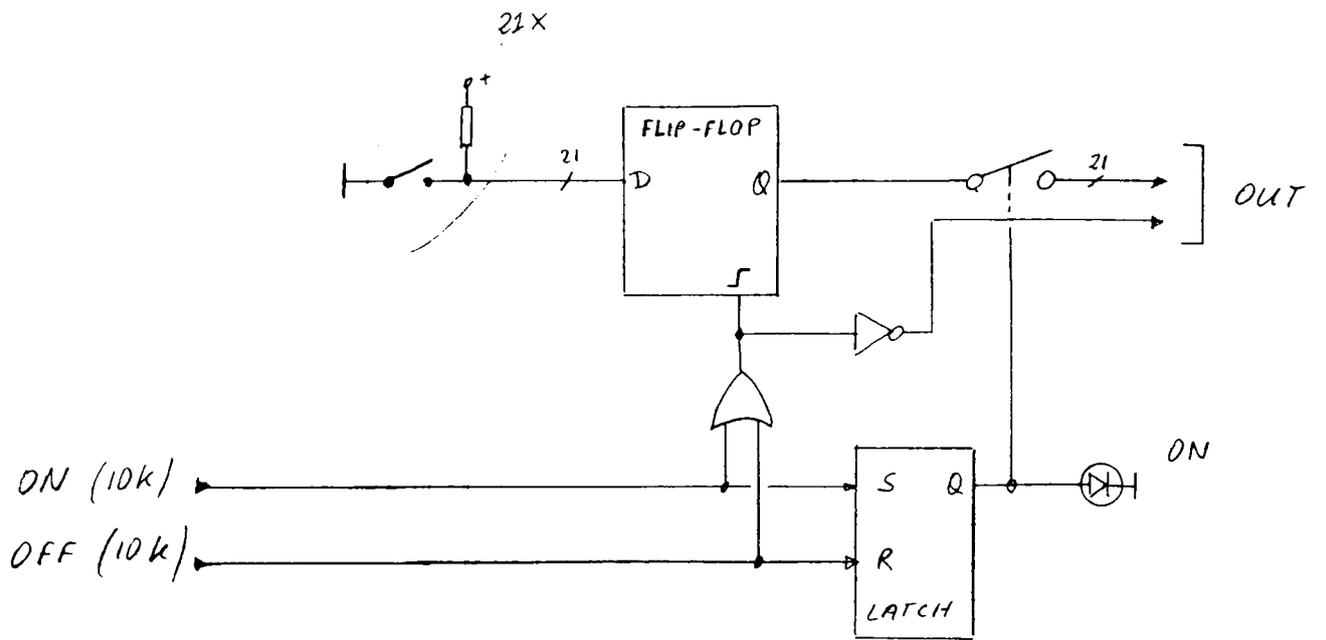
A.V.C.



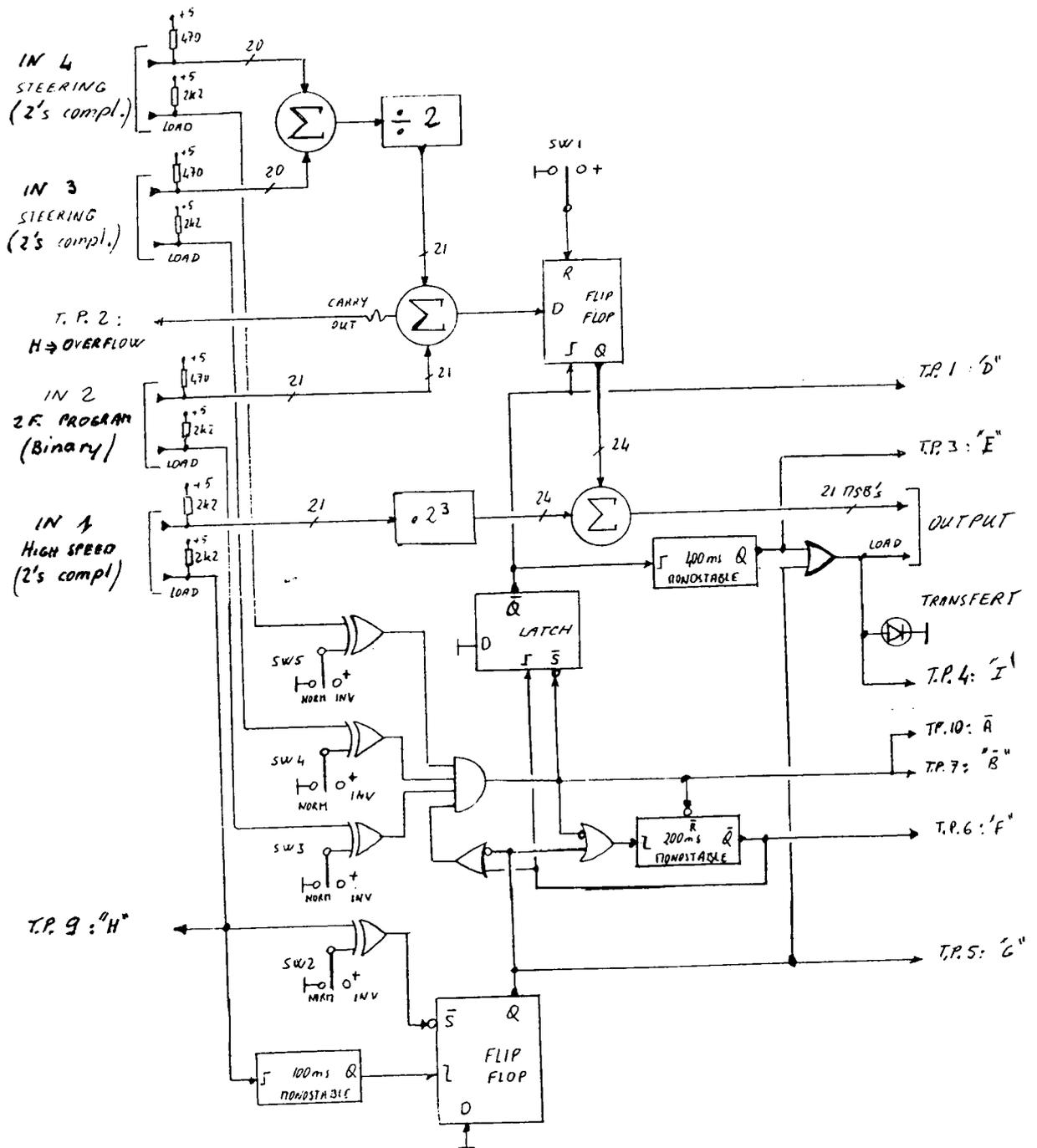
AVC CONTROL LOOP



DIGITAL DISTRIBUTION



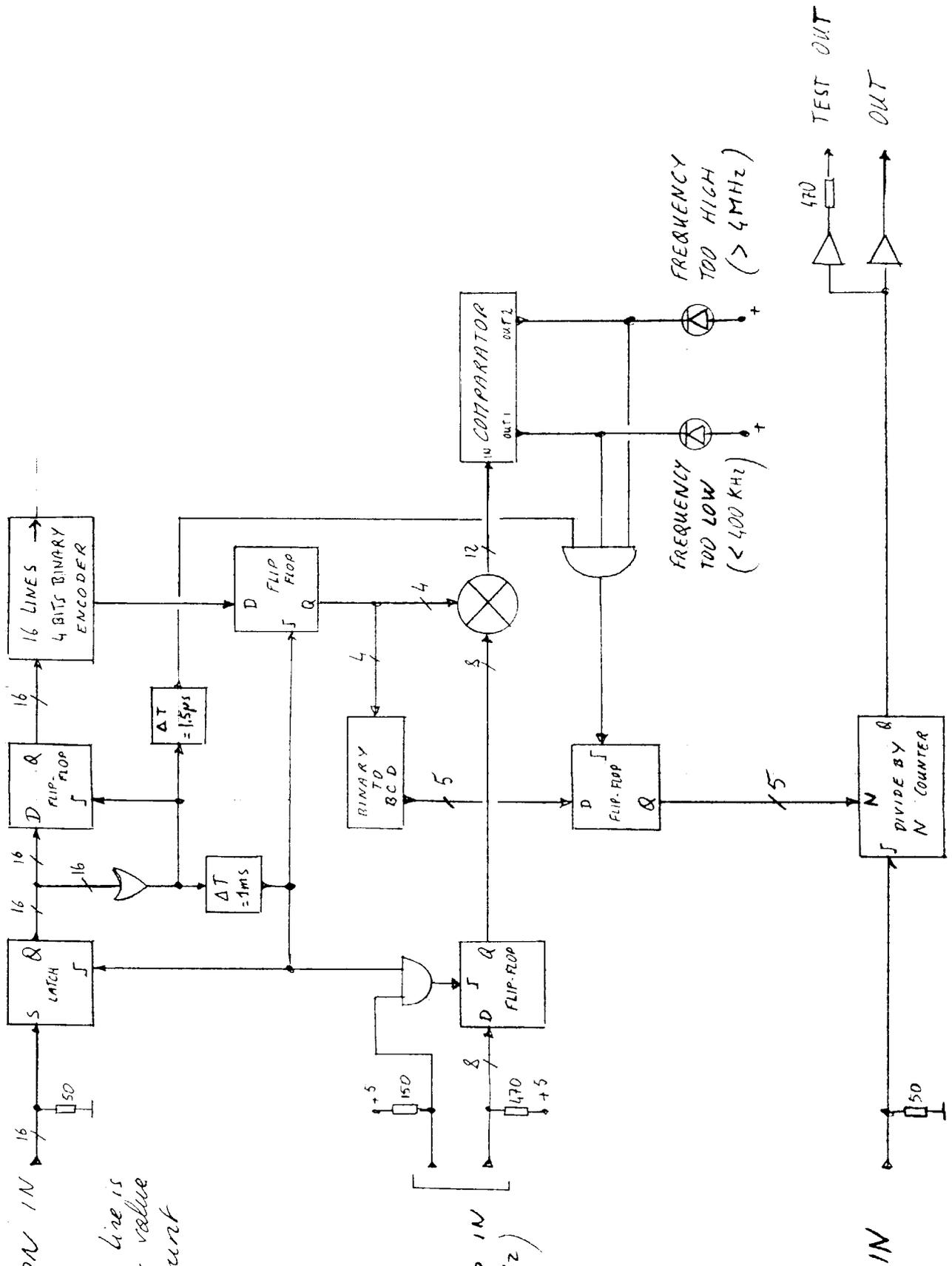
DIGITAL OFFSET
REGISTER



DIGITAL SUMMING UNIT

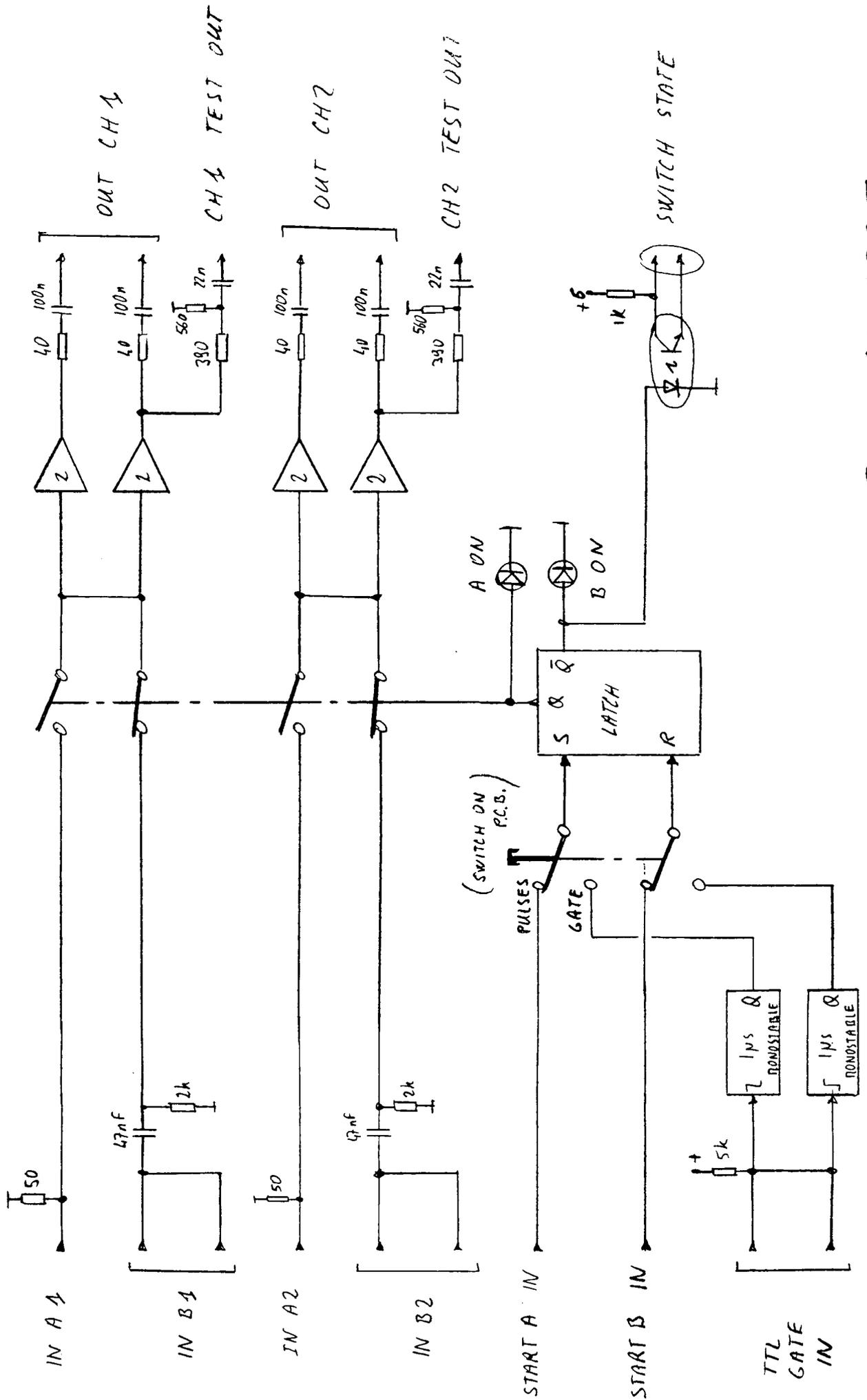
DIVIDER SELECTION IN
 (0/4 → 0/16)

IF more than one line is selected the biggest value is taken in account

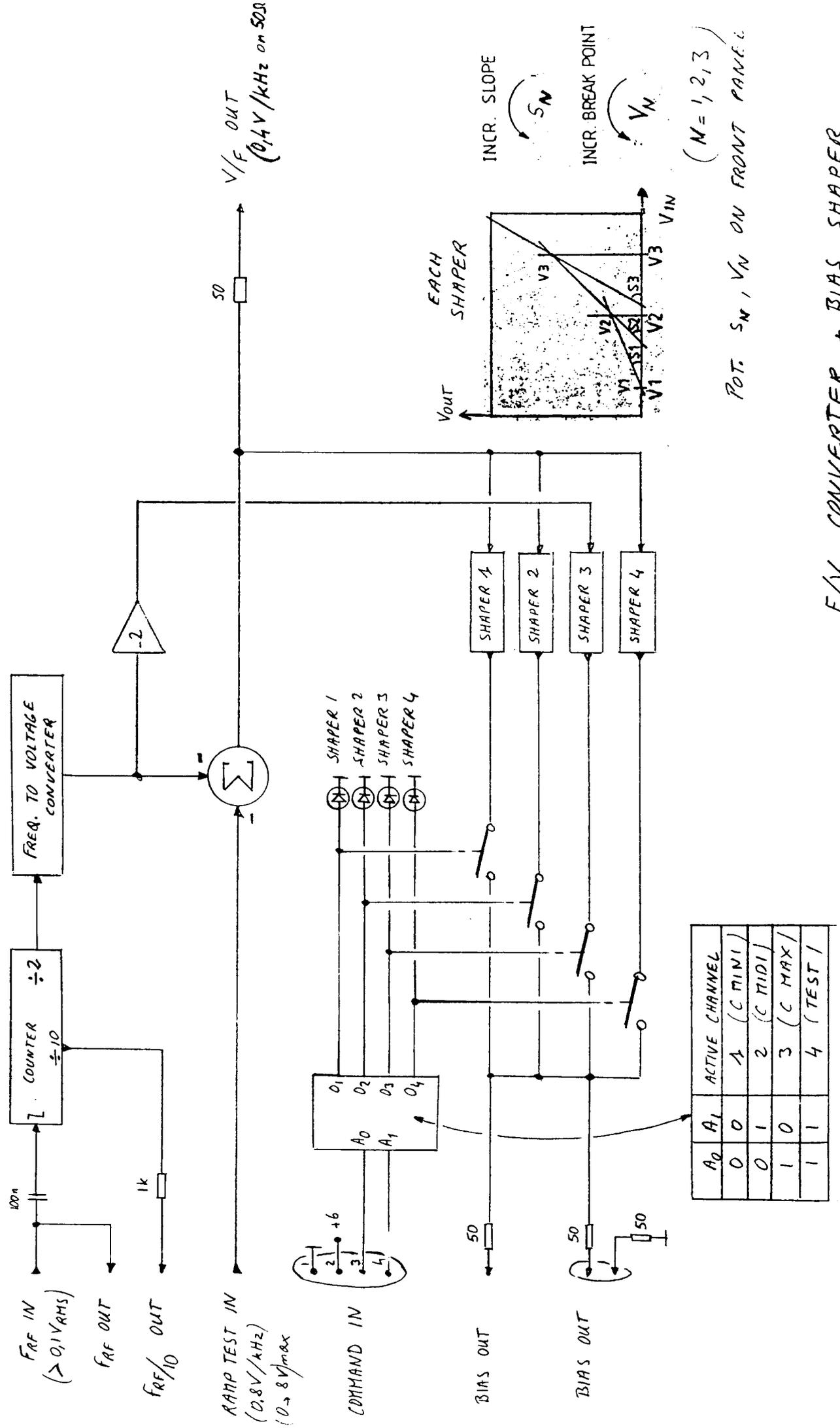


FREQUENCY WORD IN
 (0 → 2.097 MHz)

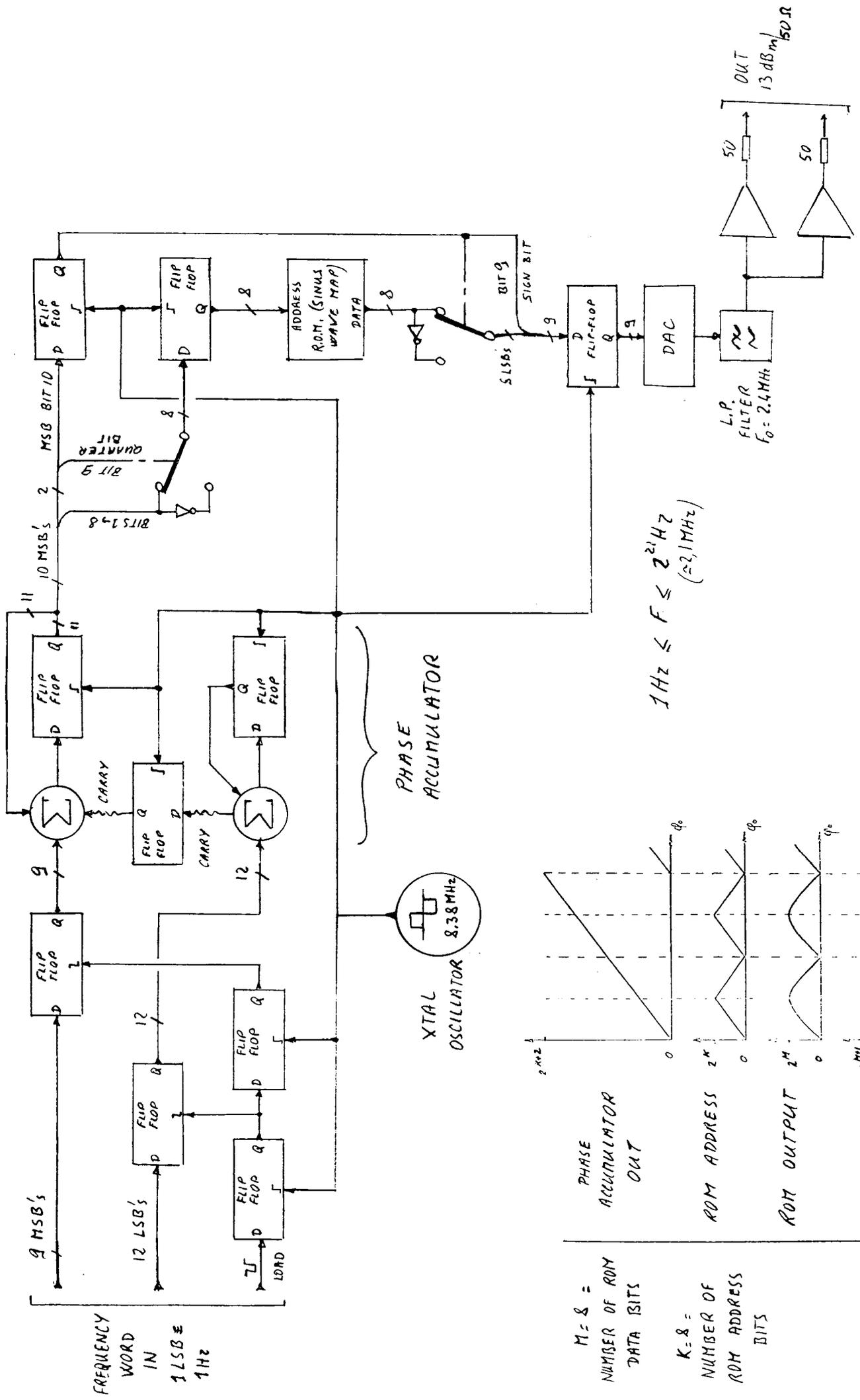
DIVIDER & INTERLOCK



DUAL RF S.P. 2.T.

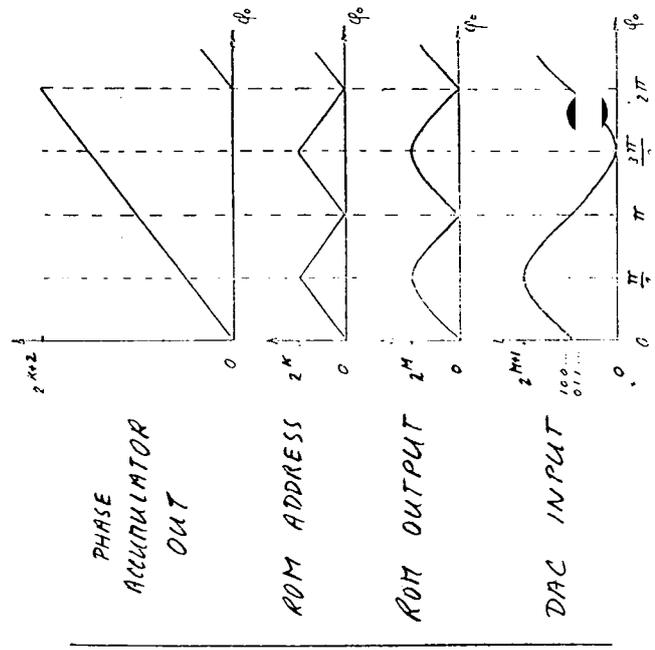


A ₀	A ₁	ACTIVE CHANNEL
0	0	1 (C MINI)
0	1	2 (C M1D1)
1	0	3 (C MAX)
1	1	4 (TEST)



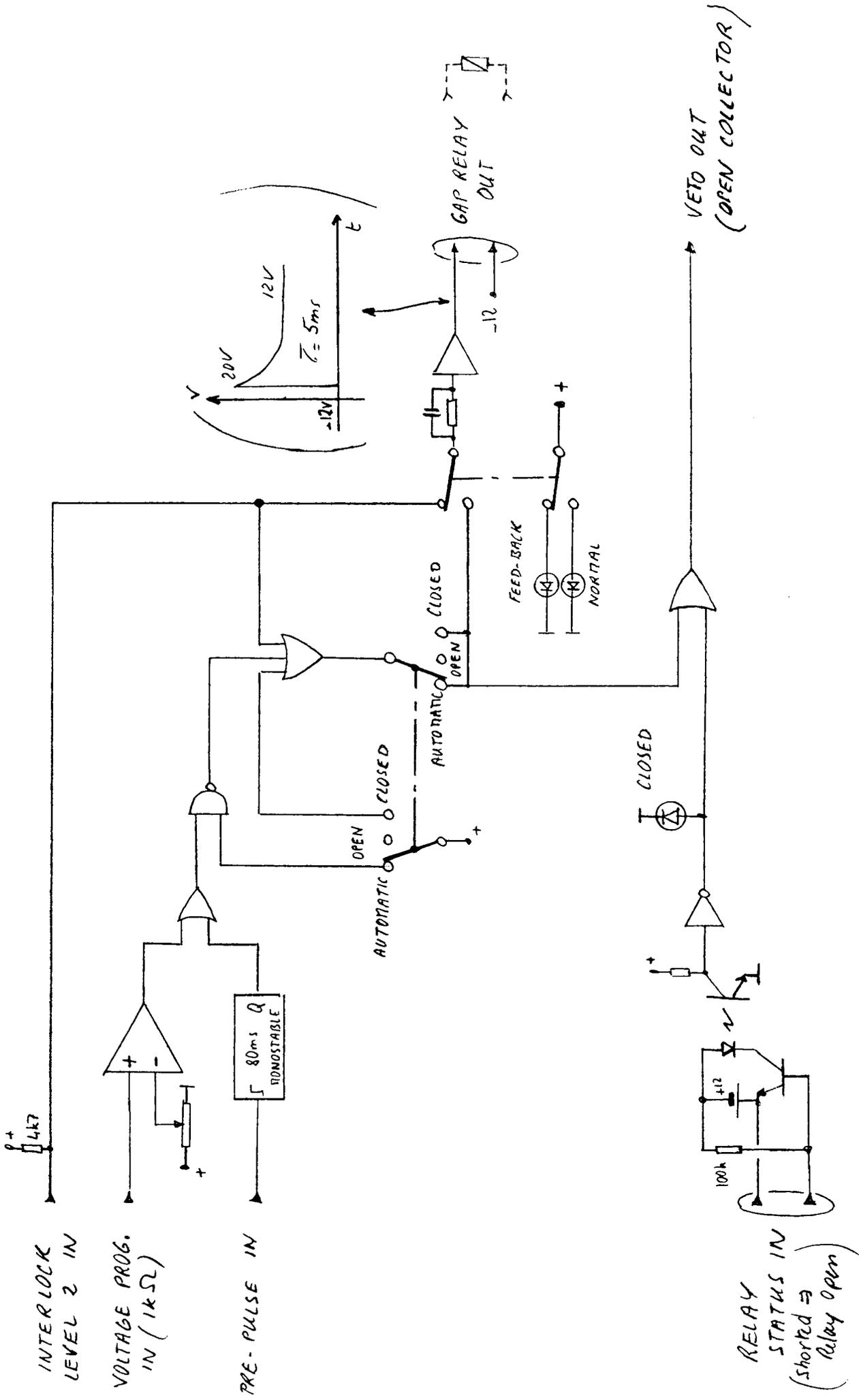
FREQUENCY WORD IN 1571 1 Hz

M = 8 = NUMBER OF ROMY DATA BITS
 K = 8 = NUMBER OF ROMY ADDRESS BITS

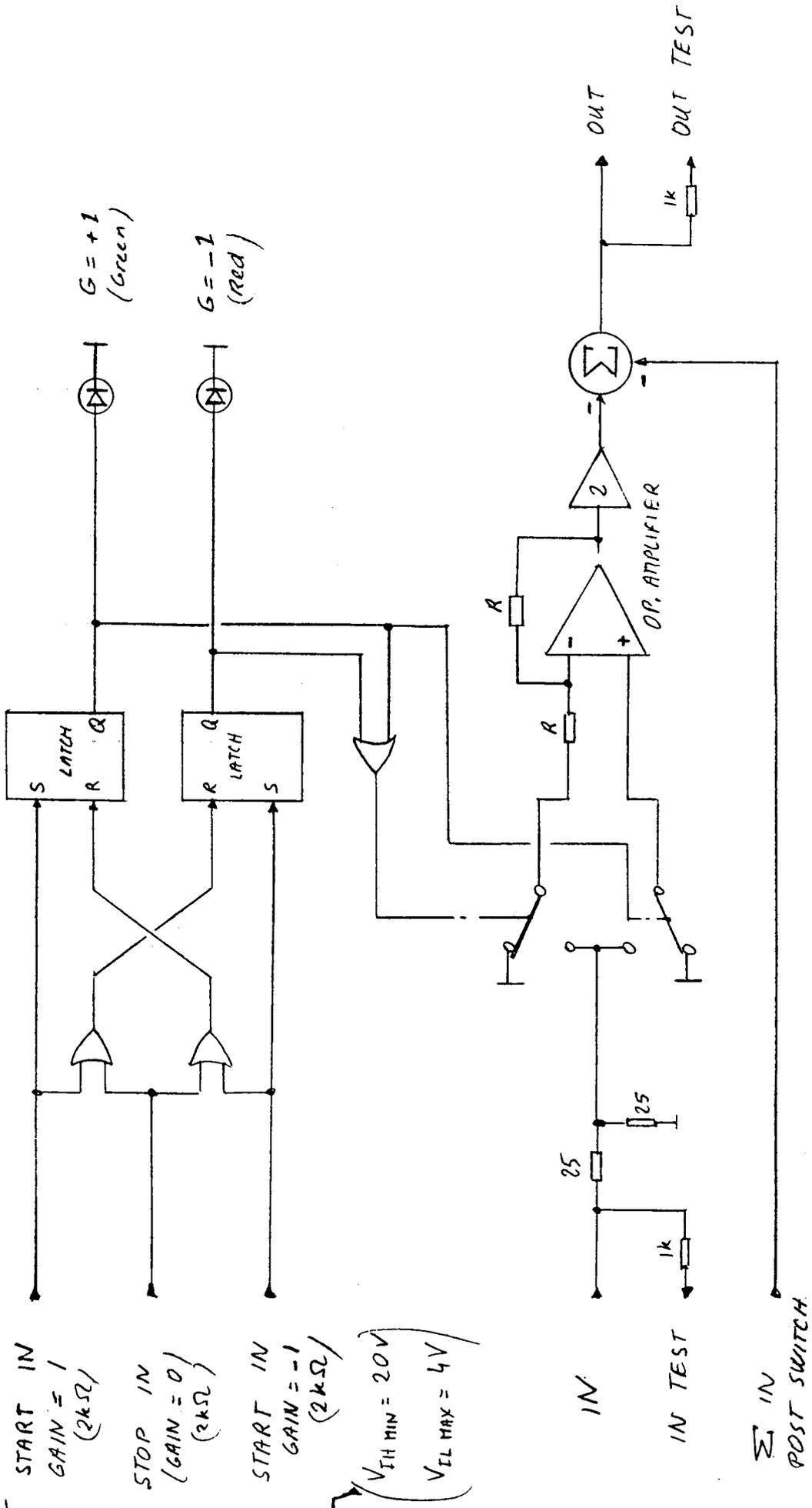


$$1 \text{ Hz} \leq F \leq 2^{21} \text{ Hz} \quad (\approx 2.1 \text{ MHz})$$

FREQUENCY SYNTHESIZER

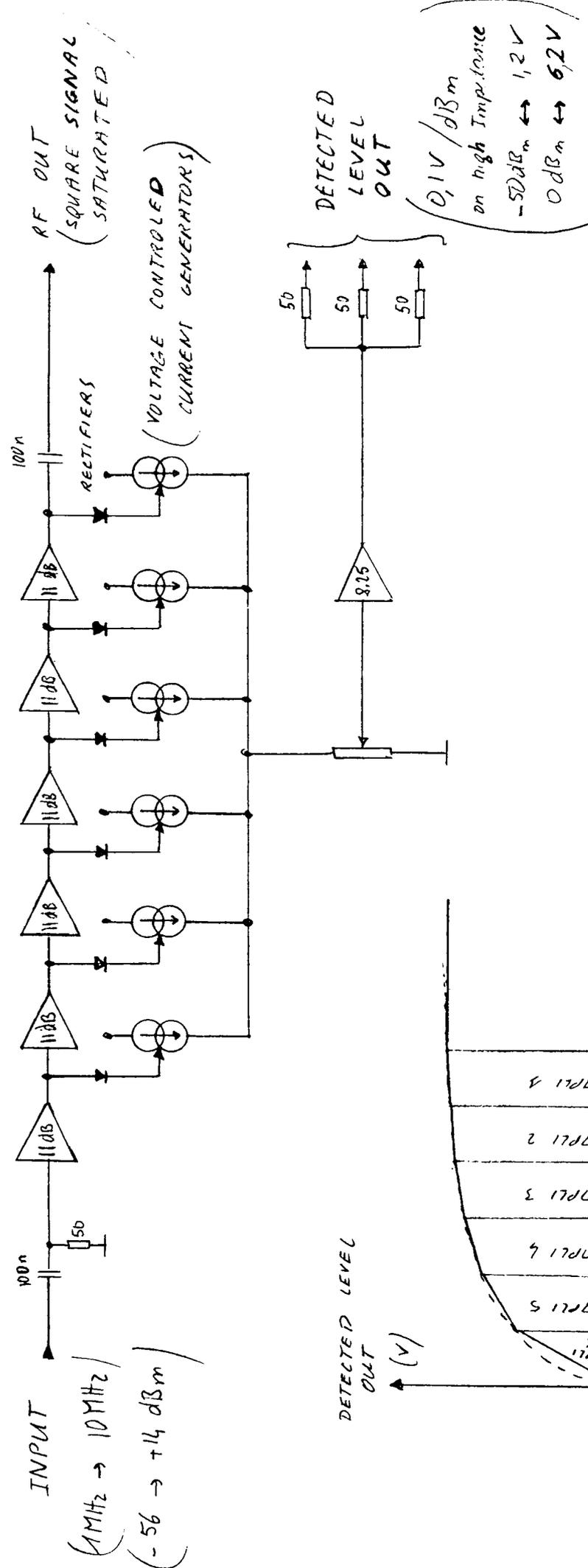


GAP RELAY CONTROL

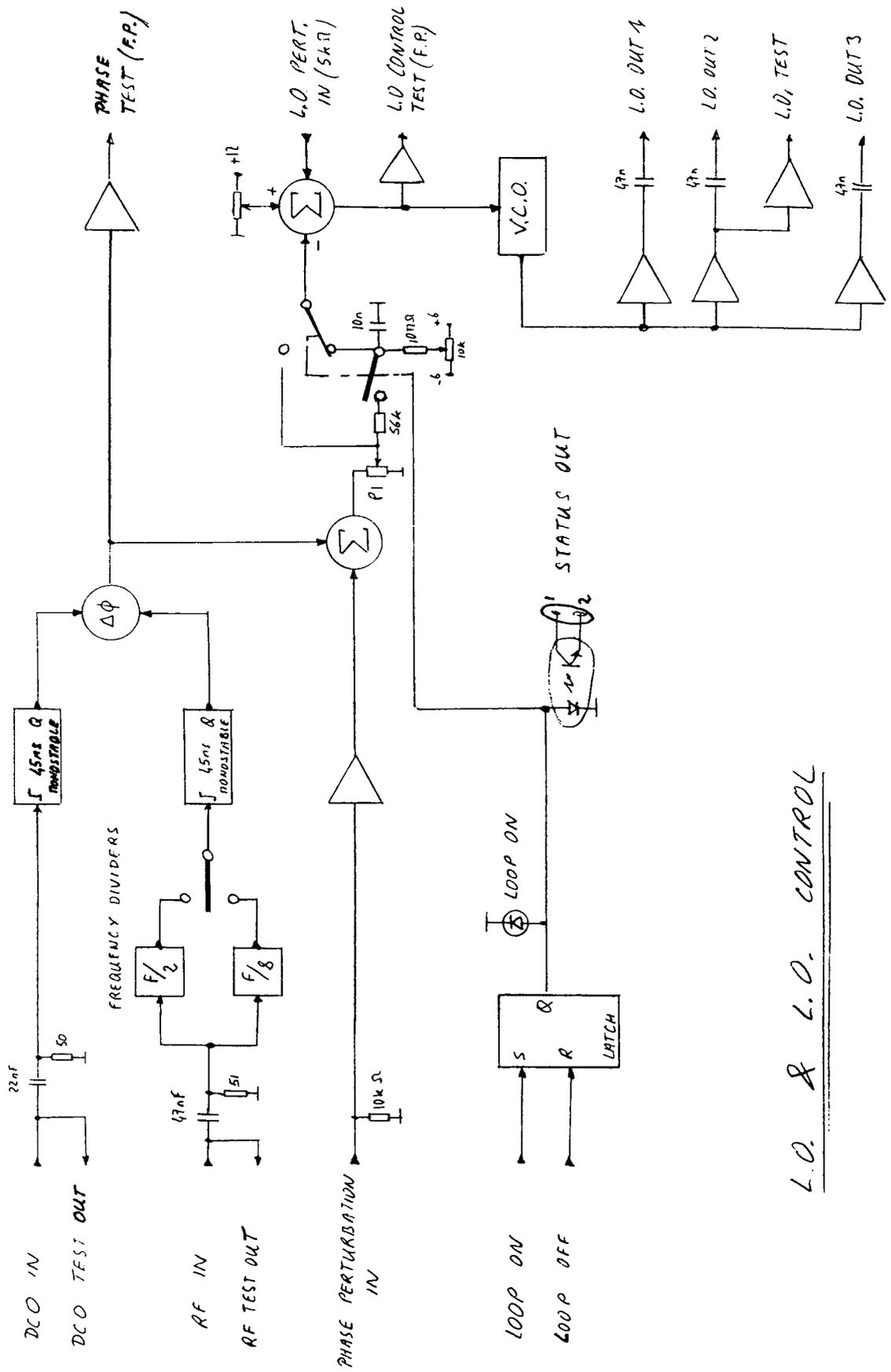


GATING & SIGN CONTROL

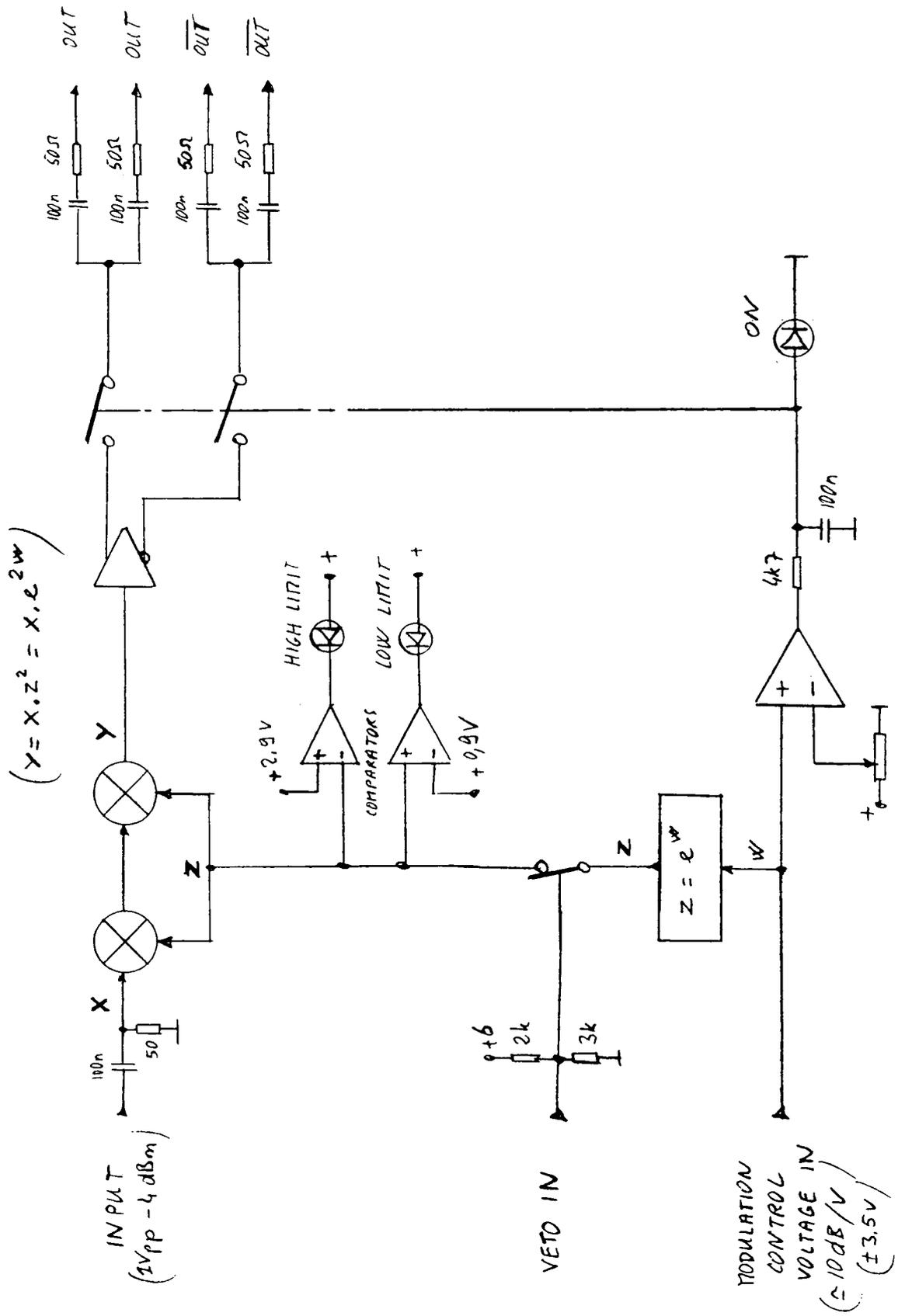
(THESE AMPLIFIERS START TO SATURATE WITH -3 dBm ON THE INPUT)



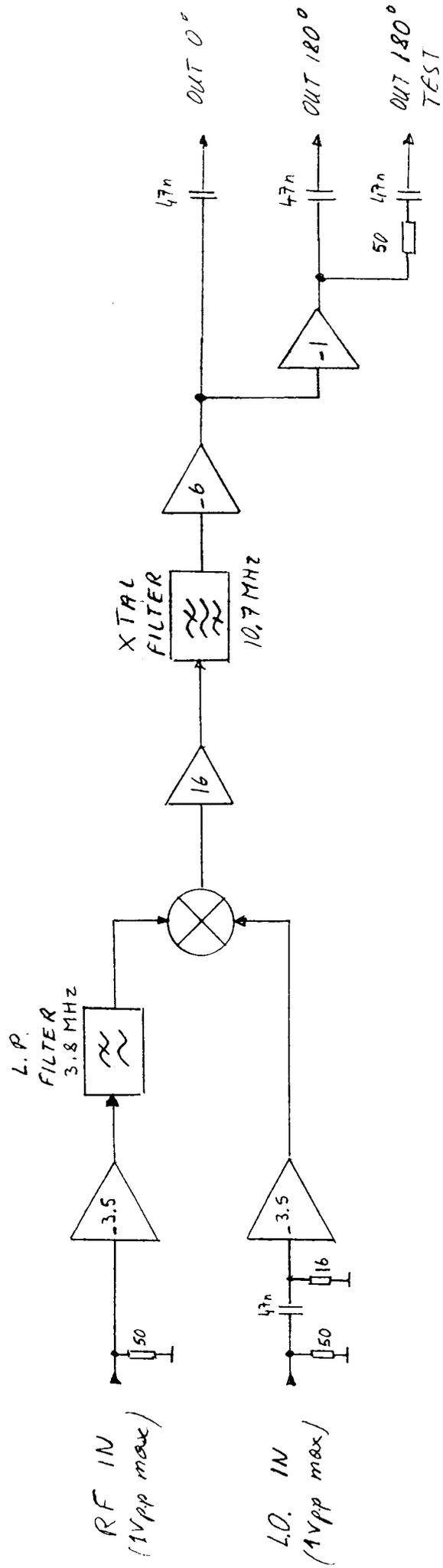
LOG DETECTOR



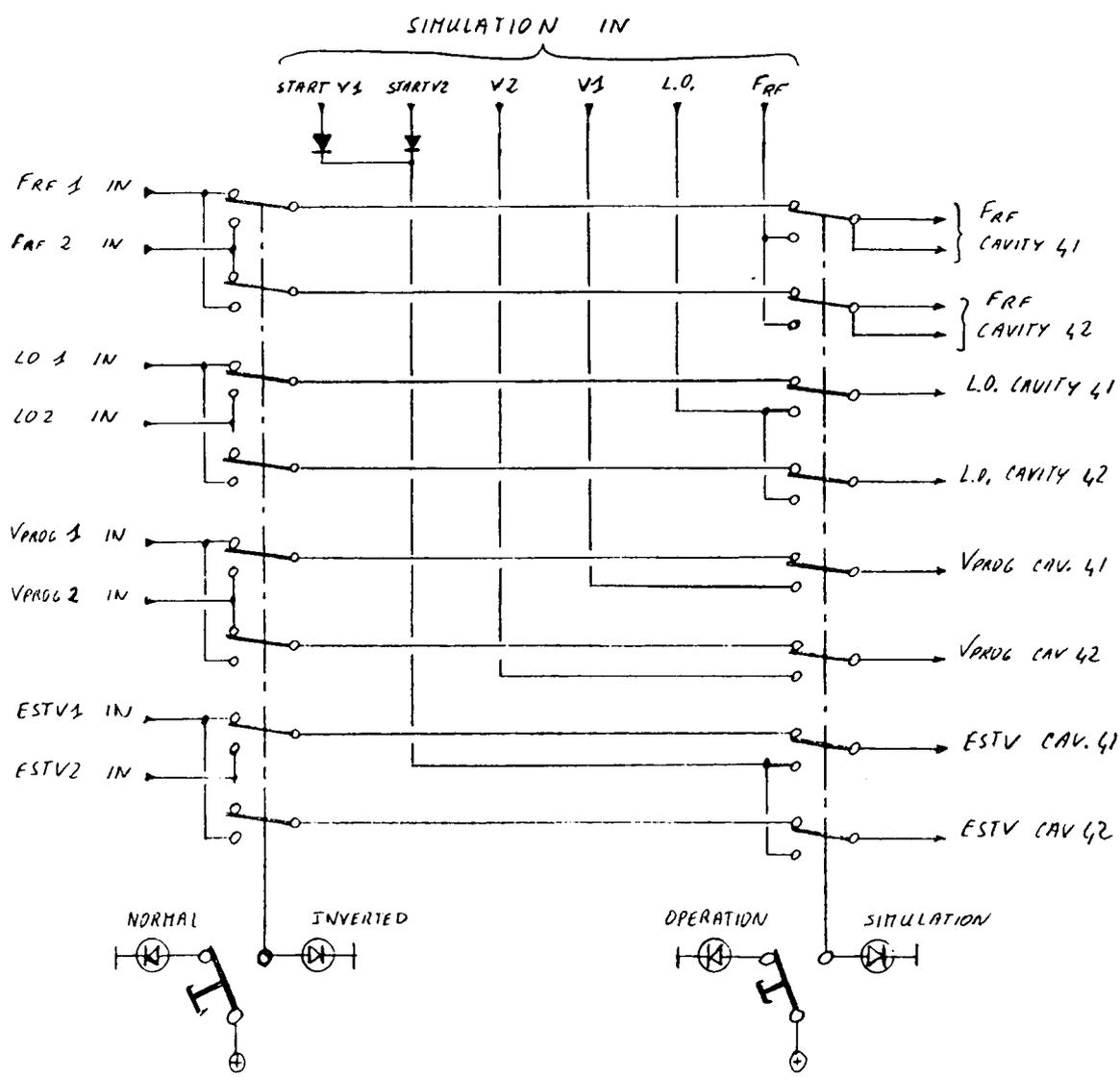
L.O. & L.O. CONTROL



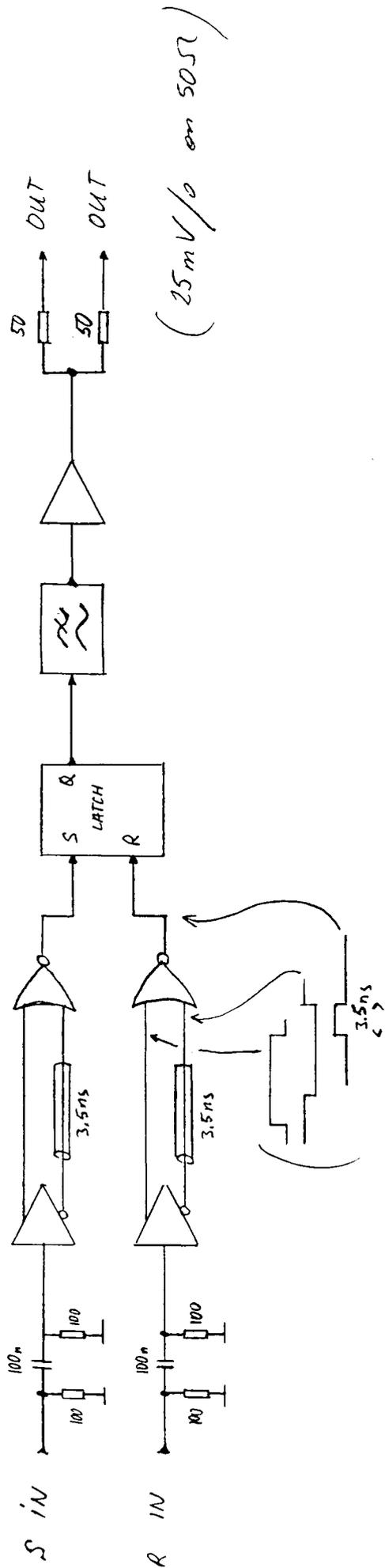
LOGARITHMIC MODULATOR



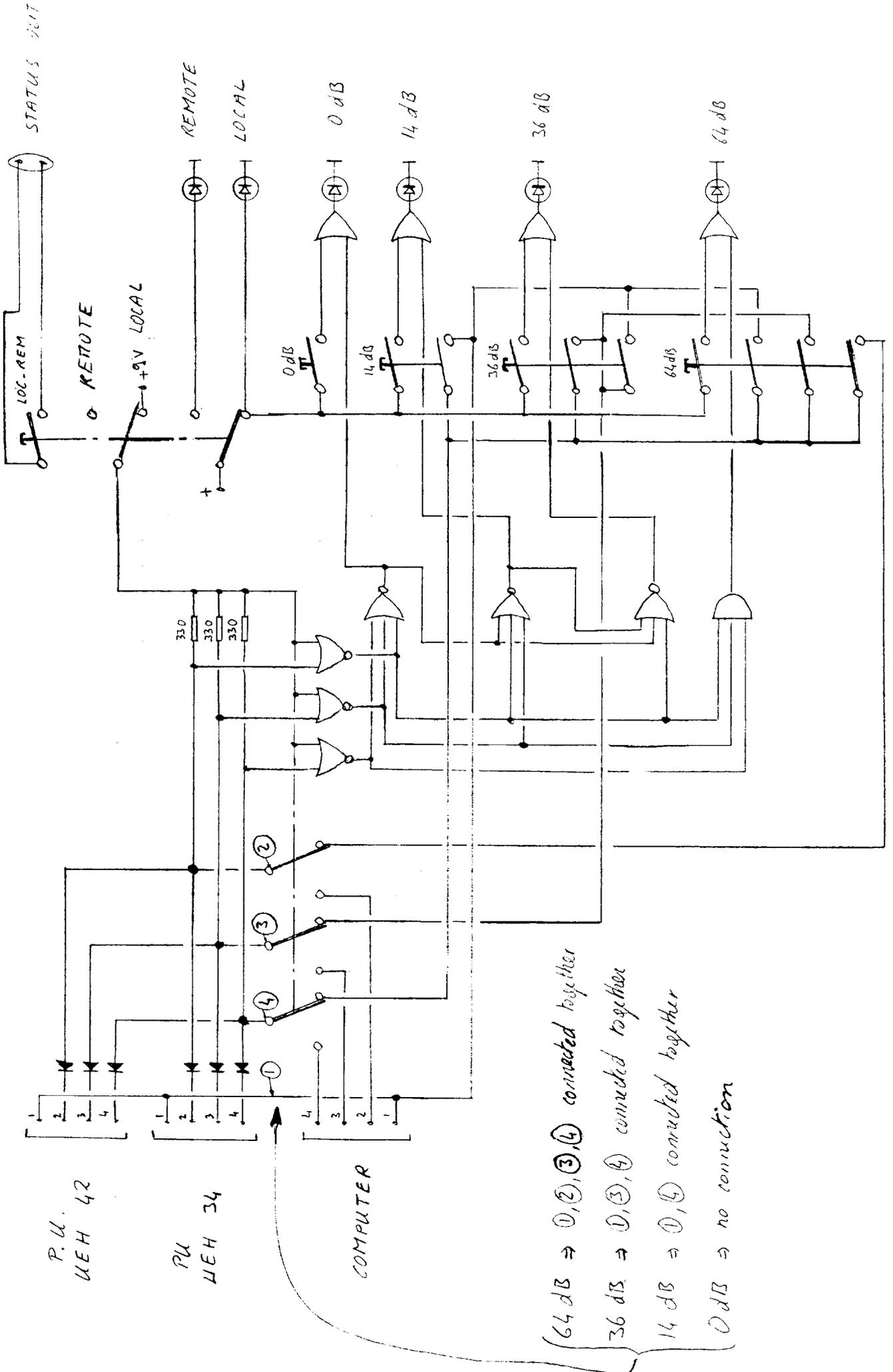
MIXER



OPERATION TO SIMULATION UNIT

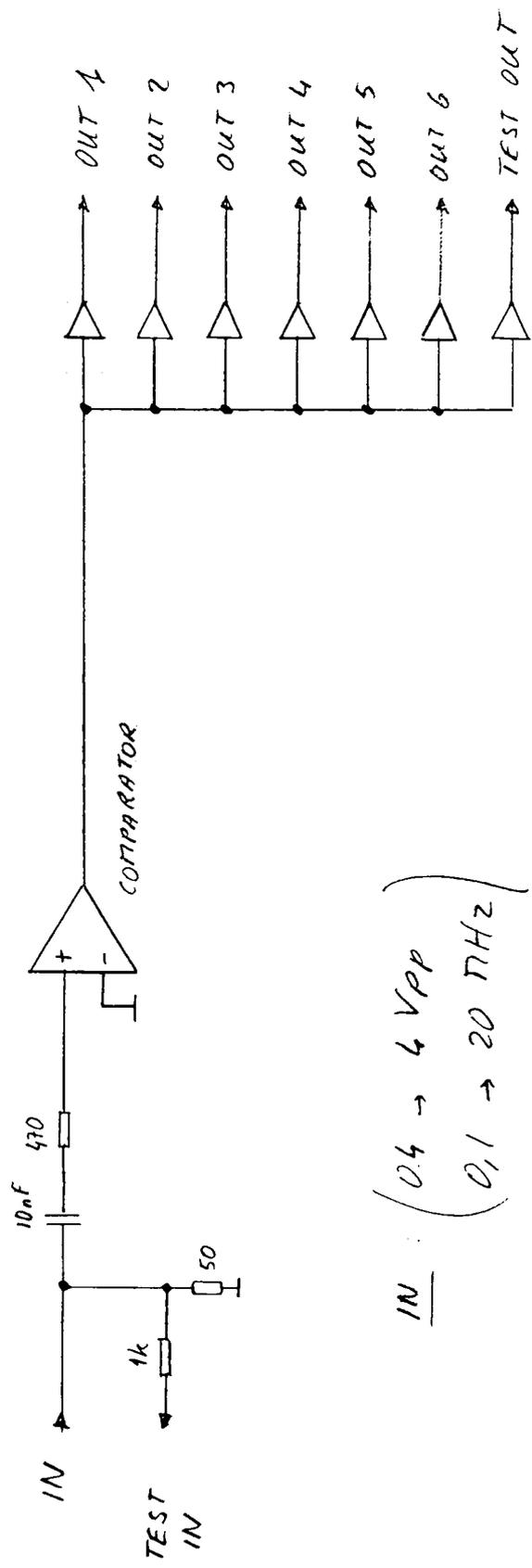


PHASE DISCRIMINATOR



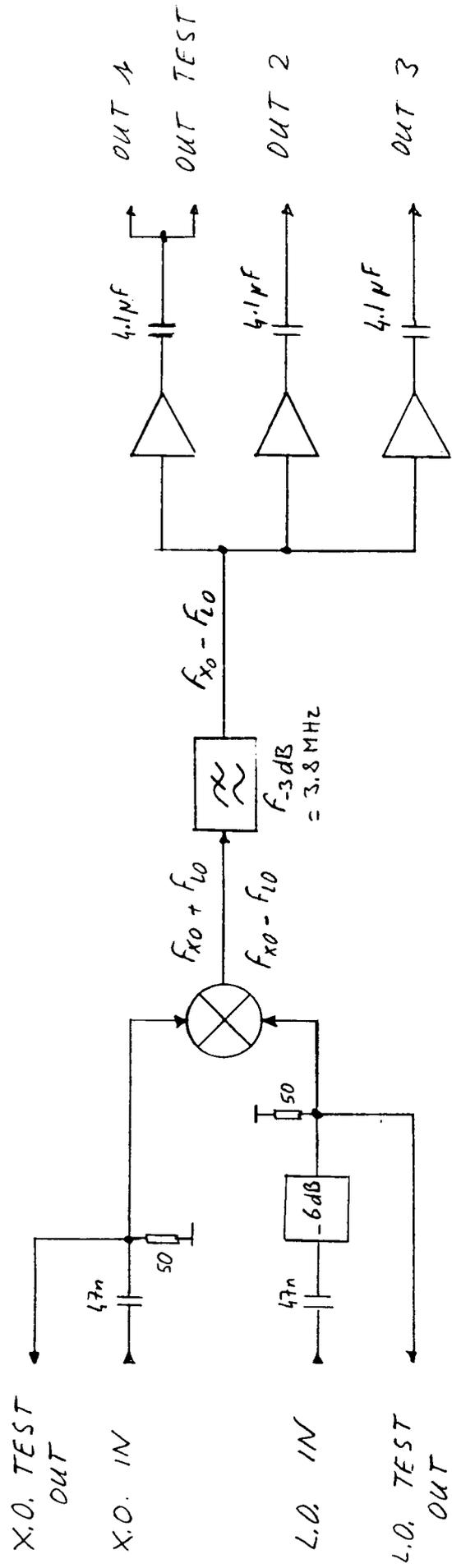
P.U. AMPLIFIER GAIN SELECTOR

64 dB \Rightarrow ①, ②, ③, ④ connected together
 36 dB \Rightarrow ①, ③, ④ connected together
 14 dB \Rightarrow ①, ④ connected together
 0 dB \Rightarrow no connection

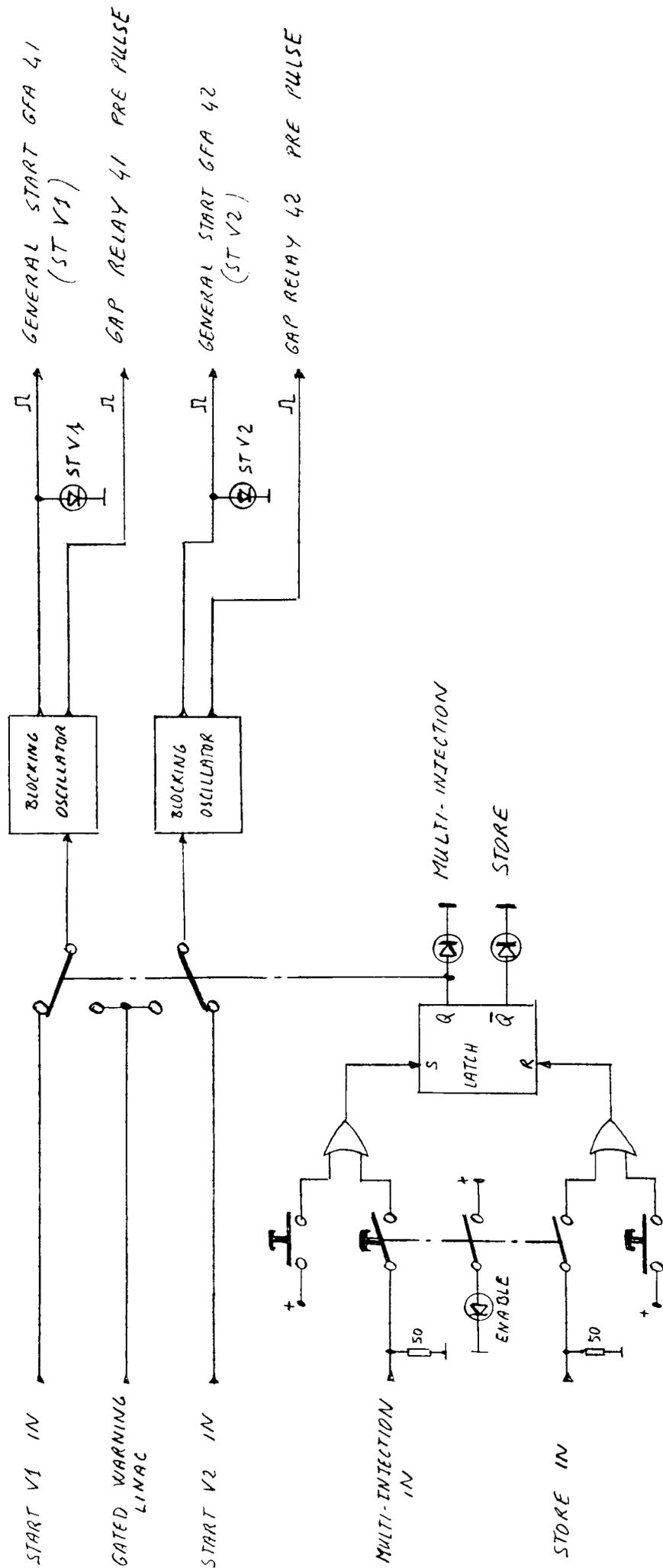


IN : $\left(\begin{array}{l} 0,4 \rightarrow 4 \text{ Vpp} \\ 0,1 \rightarrow 20 \text{ MHz} \end{array} \right)$

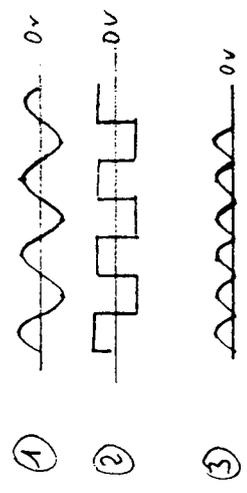
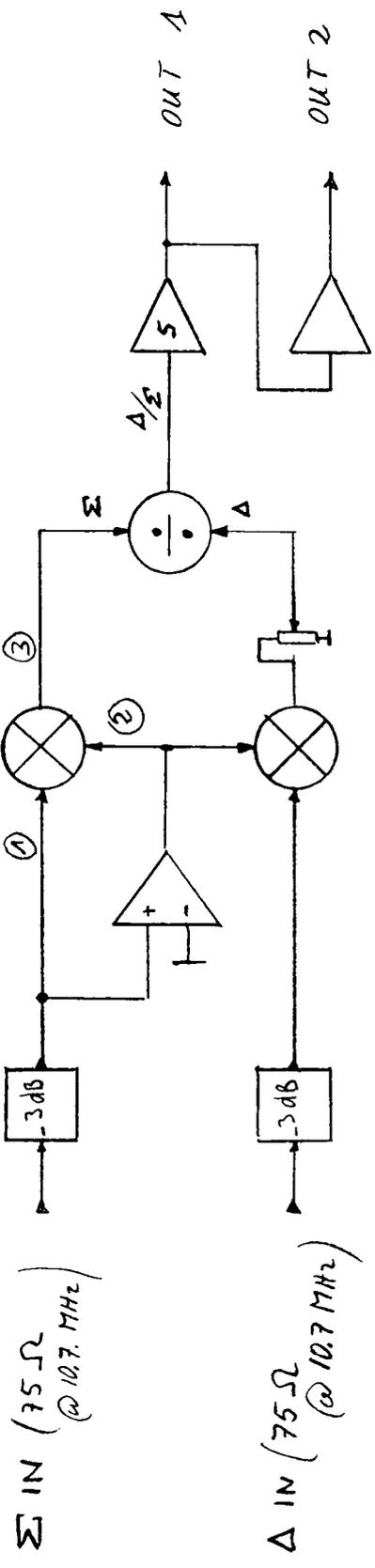
RF SHAPING
& TTL DISTRIBUTION



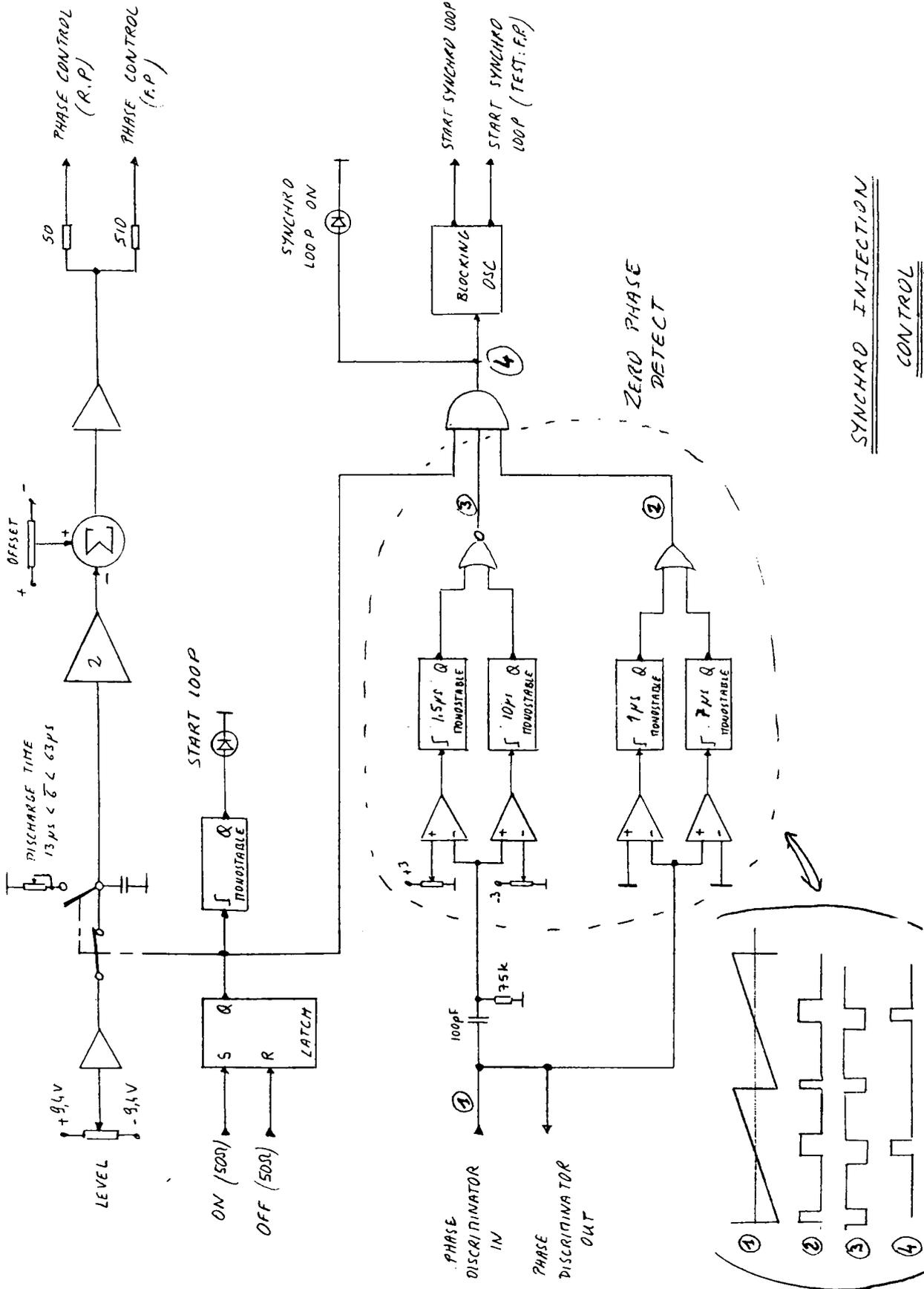
R.F. TRANSLATOR



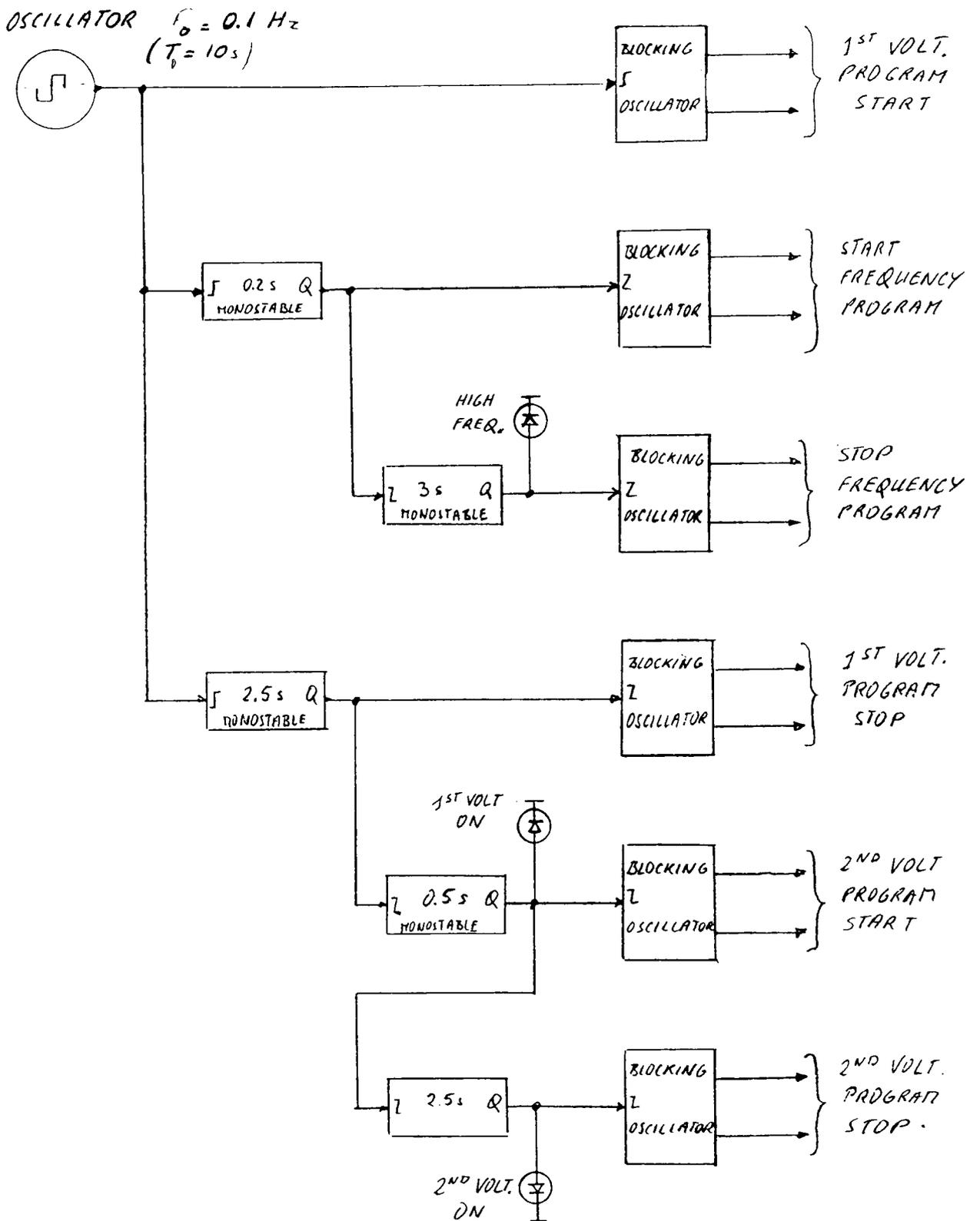
START GFA V₁, V₂
& GAP RELAY PRE-TRIGGER UNIT



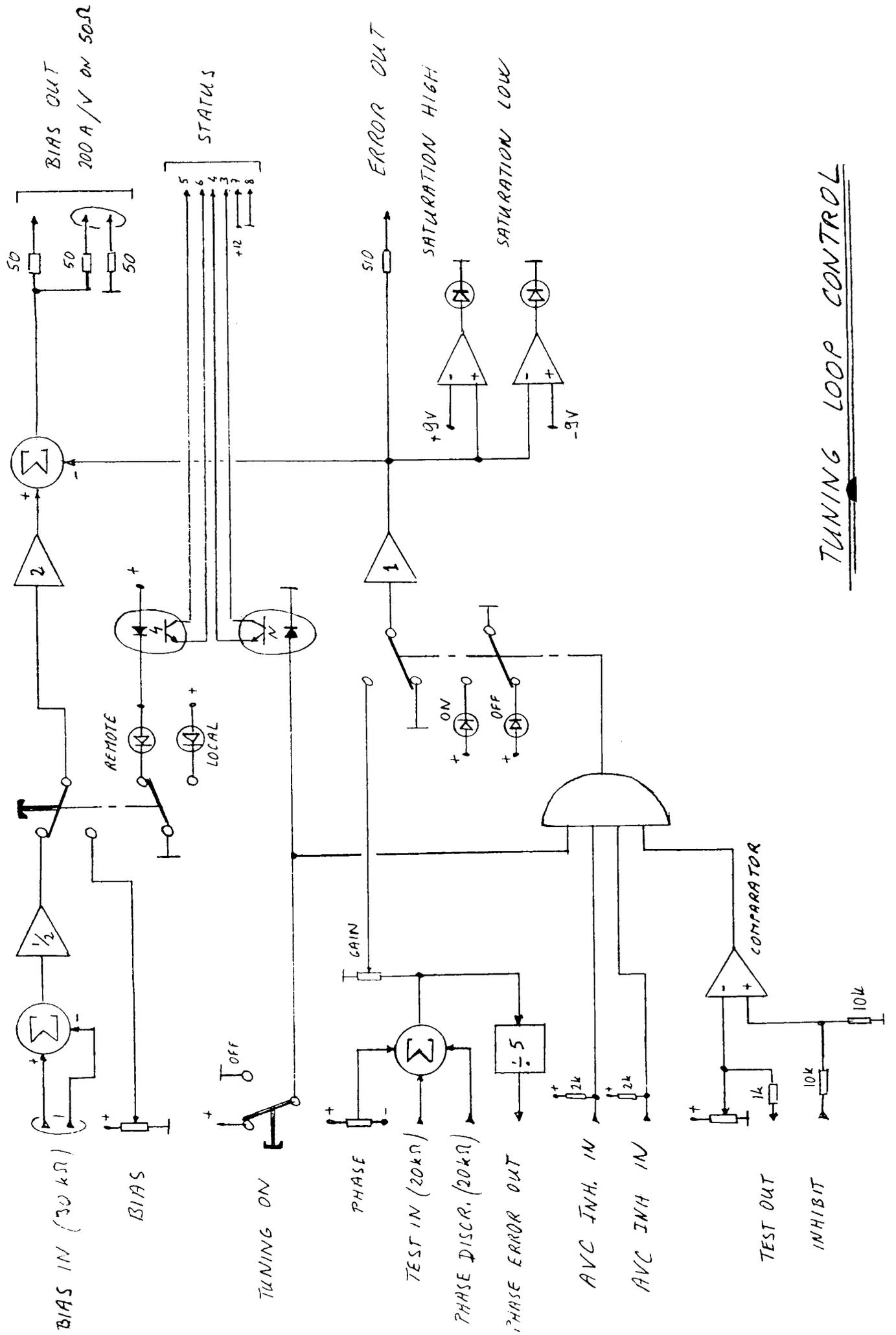
SYNCHRONOUS DETECTOR
& A/Σ



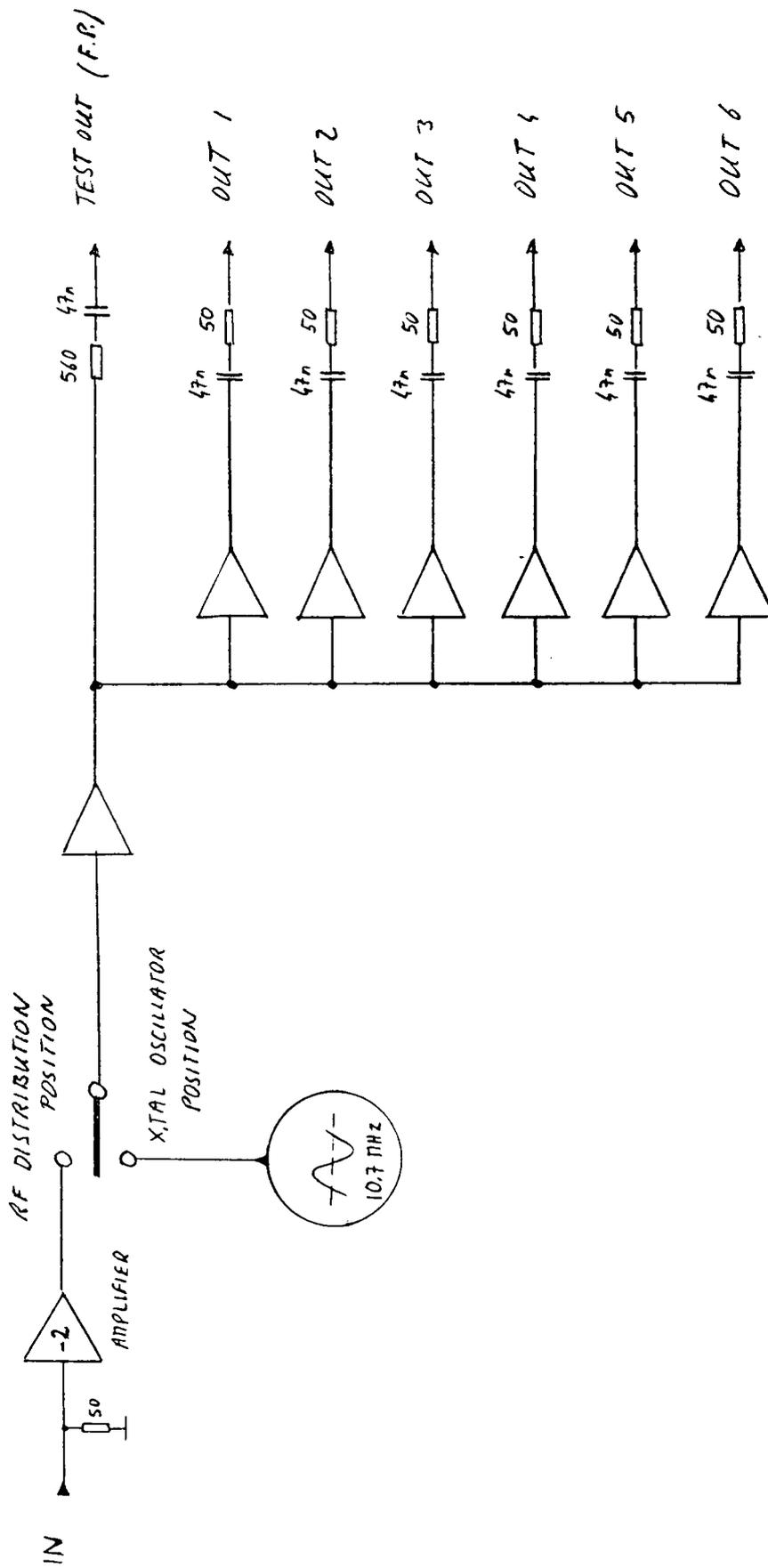
SYNCHRO INJECTION CONTROL



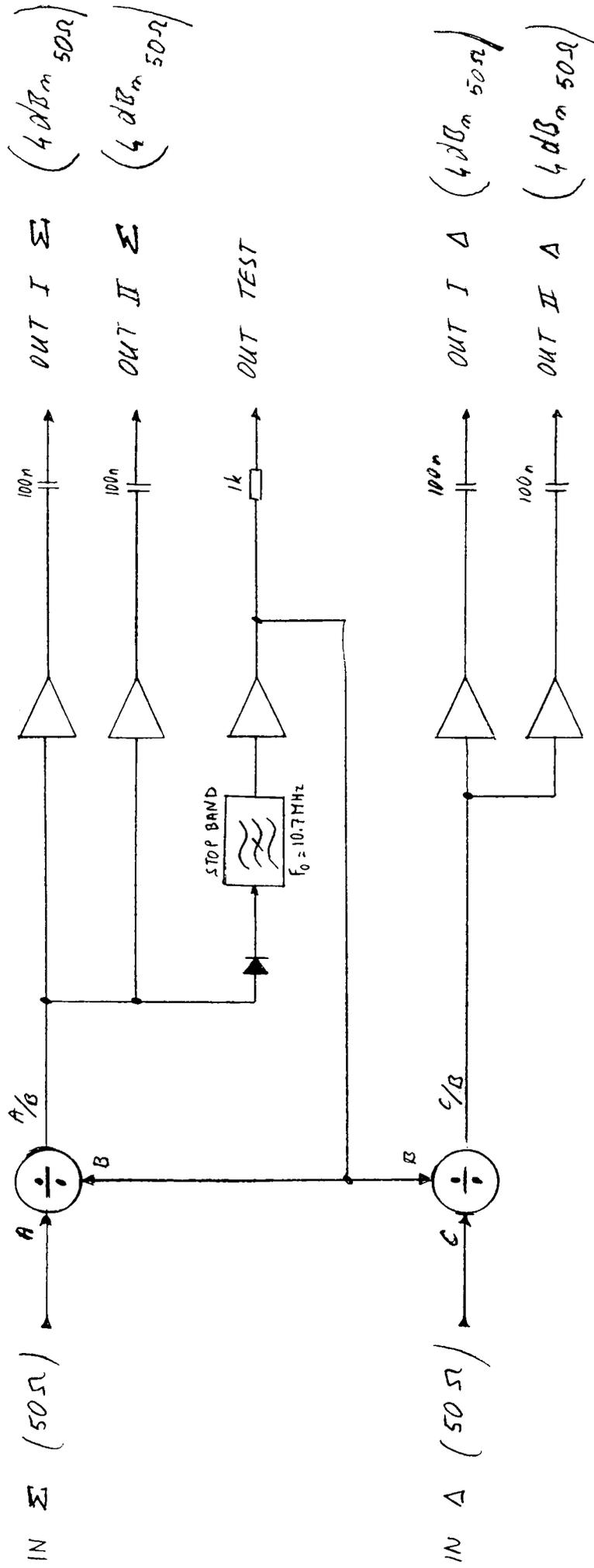
TIMING SIMULATOR



TUNING LOOP CONTROL



X.TAL OSCILLATOR 10.7 MHz
& RF DISTRIBUTION



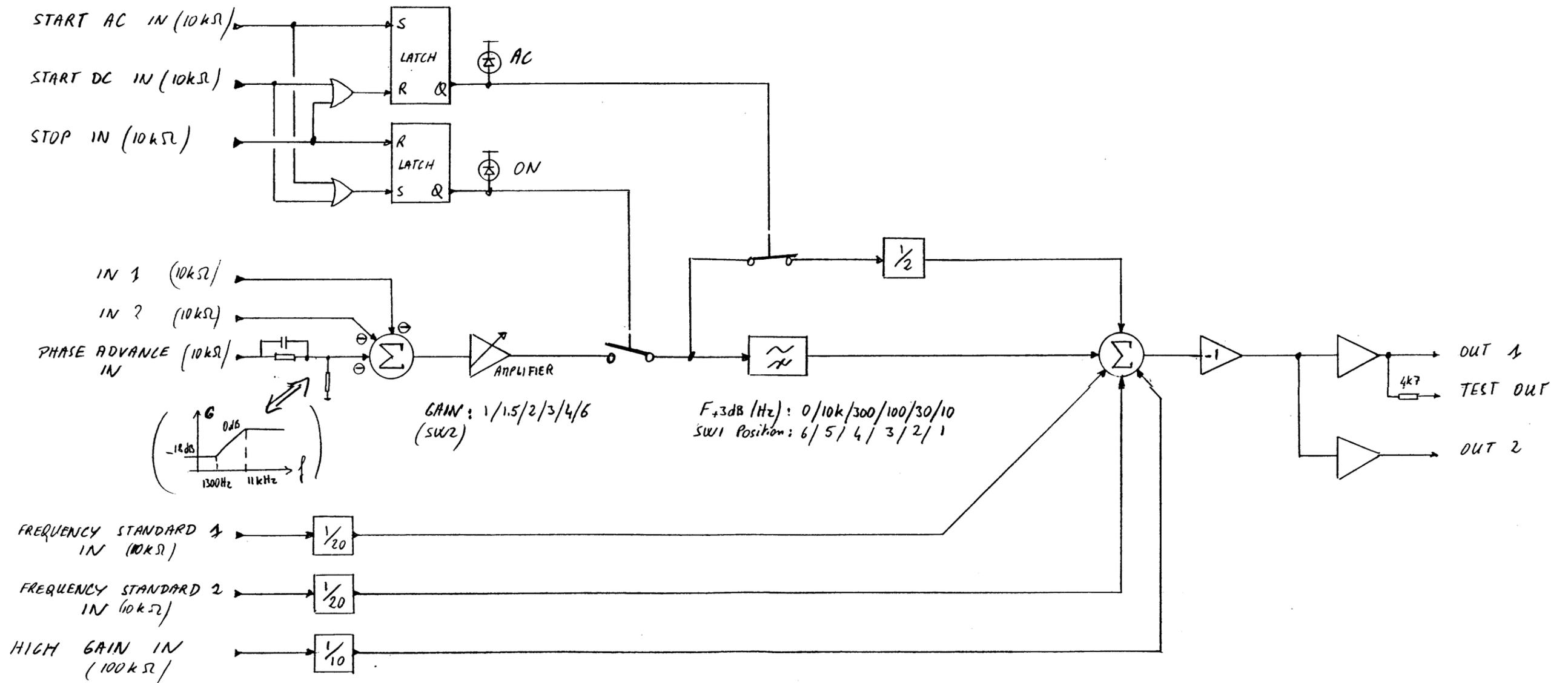
10.7 MHz DUAL AVC

REMERCIEMENTS

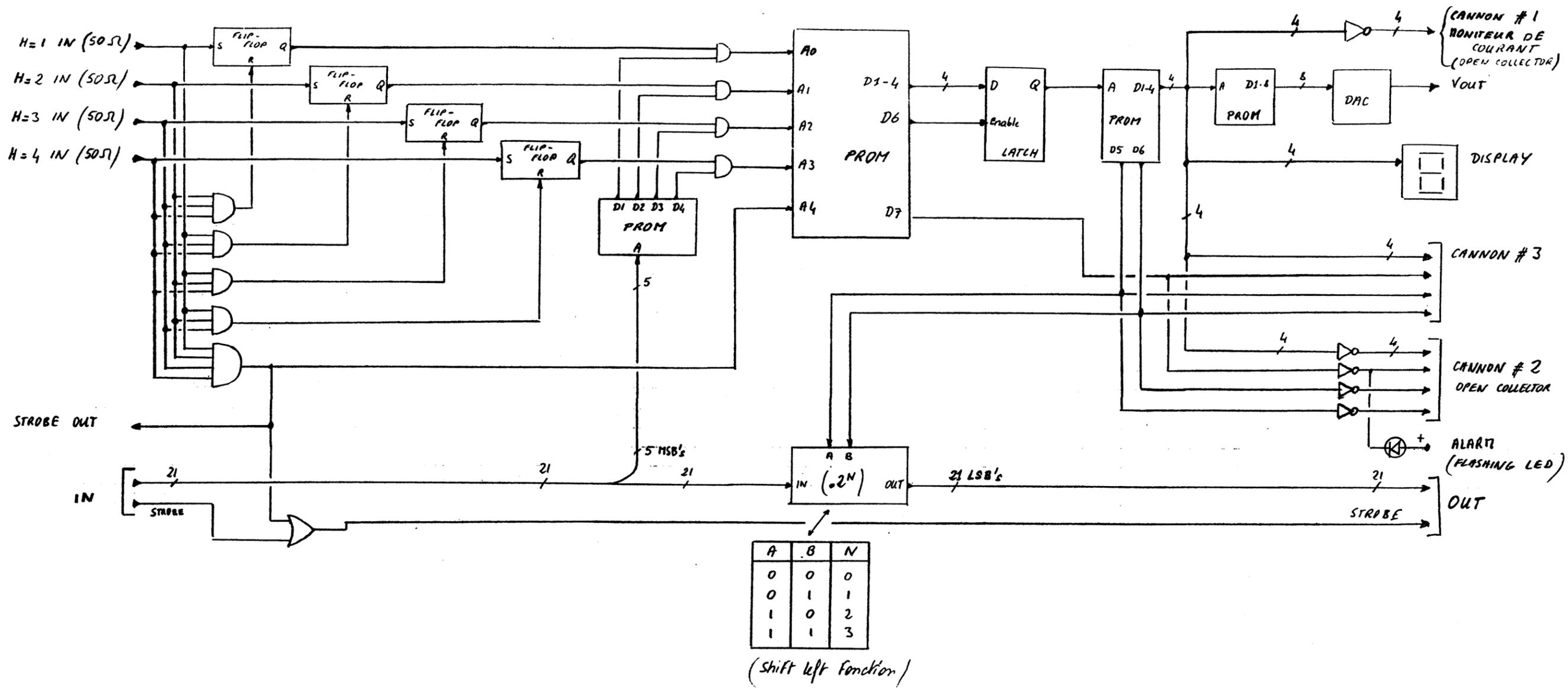
Il convient de remercier tous les concepteurs du système et des unités électroniques, dont le travail est synthétisé dans ce document, et que nous ne citons pas nominativement par crainte d'être incomplets.

Distribution :

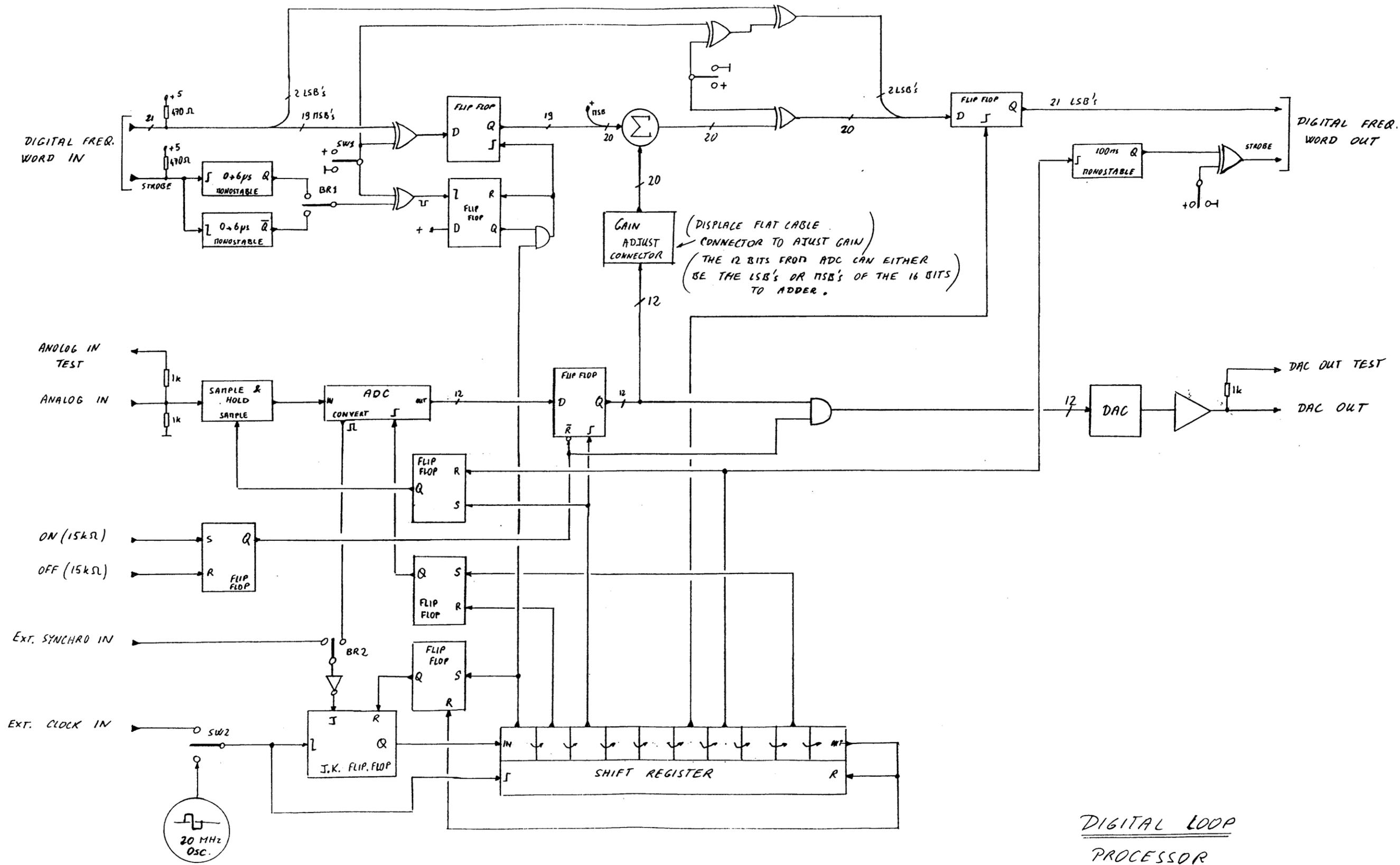
Membres de la section PS-RF-LL
Spécialistes cavités LEAR
Opérateurs et superviseurs LEAR
R. Garoby



PHASE LOOP AMPLIFIER.



LEAR H=n SELECTOR



DIGITAL LOOP
PROCESSOR

