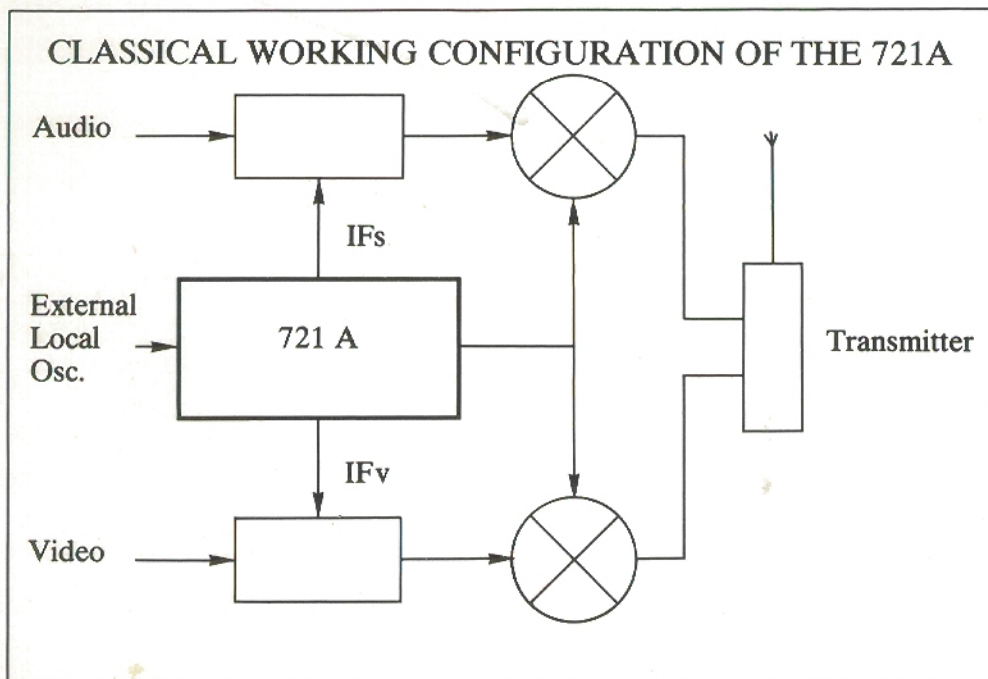


TV SYNTHESIZED DRIVER 721 A



- **Bands :** I, III, IV and V.
- **Frequency range :** 40 – 160 MHz
- **Resolution :** 0.1 Hz
- **Outputs (BNC sockets) :**
 - IF : video (F1), audio (F2 In option)
 - Transposition frequency : F3
- **Output level :** adjustable from 11 to 17 dBm/50Ω
- **Inputs :**
 - External time base frequency : 1, 5, 10 MHz
 - External DC voltage (driver locking)
- **Spectral purity :**
 - Harmonics : ≤ -20 dB



WHY USING A SYNTHESIZED TRANSMITTER DRIVER ?

Master oscillators have been traditionally assuming the driving of transmitters. This has been satisfying as far as the transmitters density remained low. But, now, in most countries, to put a new transmitter into service induces many problems of jamming, which can only be avoided by offsetting the carriers with a calculated value. This technique is often called accuracy offset.

Here a synthesized driver offers two major types of advantage :

- Performance advantages : stability, facility for synchronizing a network, line and frame offsets.

- Easiness of maintenance, utilization and remote surveying : equipment standardization, immediate interchangeability.

Since one crystal oscillator assumes the synthesis of all the frequencies, this involves a perfect synchronism between the IF (ies) and the transposition frequency. A synthesized driver uses measuring designed crystals. these are mass-produced. This ensures a constant and higher quality than that of crystals produced by the unit.

The display of the translation frequency takes the frequencies offsets into account. The offsets do not need any intervention on the reference oscillator, of which the stability is sufficient to provide line offsets.

The oscillator locking allows the networks synchronization, and the carrier frame offsetting. This locking can be achieved by using a 1,5 or 10 MHz external time base.

UTILIZATION

If a transmitting station has a few transmitters, only one high stability standard oscillator is required to lock all the synthesized drivers.

Then all the transmitted carriers are synchronized to the standard. This reference oscillator can be either an automatic standard, or more simply, a frequency standard receiver 4101A ADRET. (see picture below).

The frame offsets that all the specialists consider as a necessity require high relative stabilities of the carriers : ± 1 Hz. If the synthesized drivers are locked by an oscillator of which the long term stability is equal or better than 1.10^{-9} , this locking will guarantee the upholding of the displayed offsets, since the carriers are synchronized with this oscillator.

The crystal drivers are specific to each transmitter, even though a synthesized driver can drive any transmitter. With it, you can also instantaneously obtain any frequency. It will take you a long time to get it if you buy a specific crystal driver.

The 0.1 Hz resolution allows the transposition frequency to have a resolution better or equal to 1 Hz (depending on the multiplication rates).

The external DC voltage provides an adjustment of the relative phase of two transmitters.



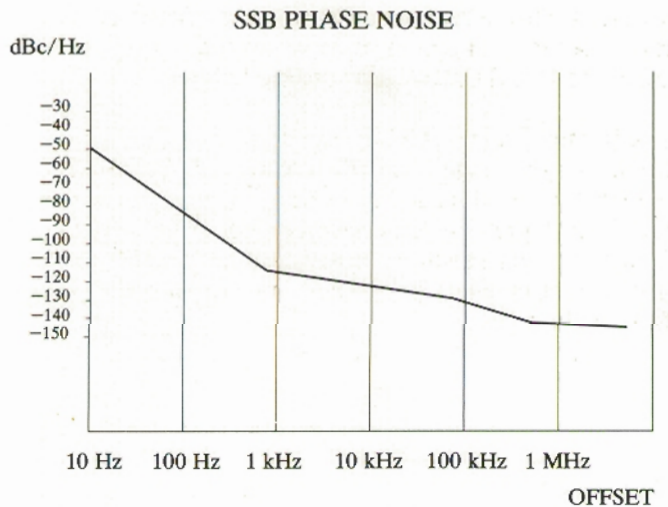
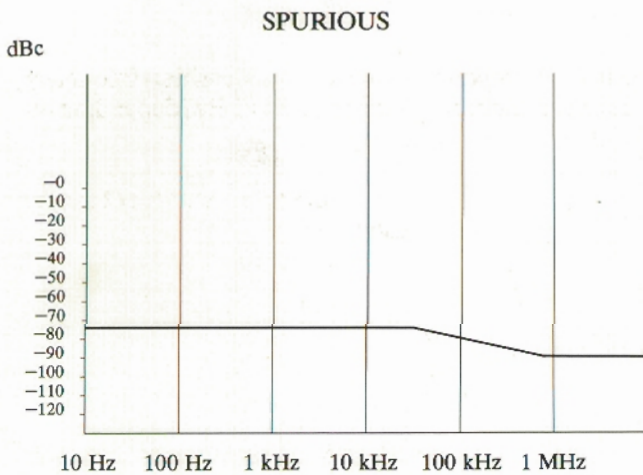
SPECIFICATIONS 721 A

- **Intermediate frequencies, F1 and F2**
 - In factory adjusted from 30 to 40 MHz, by 100 kHz steps.
 - Other values on request.
- **Transposition frequency, F3**
 - 2 outputs 40 to 160 MHz
 - Resolution : 0.1 Hz
 - Display of the transposition frequency by thumbwheel before multiplication.
- **Reference oscillator**
 - Built-in oscillator OCXO model 623C ADRET
 - Frequency : 10 MHz
 - Stability :
 - $2 \cdot 10^{-8}$ per day after 72 hours working
 - $3 \cdot 10^{-9}$ per day after 3 months working
 - $1 \cdot 10^{-7}$ over 3 months after 3 months working
 - Stability as a function of the temperature :
 - $2 \cdot 10^{-8}$ for temperatures between $+10^{\circ}\text{C}$ and $+50^{\circ}\text{C}$ (temperature gradient : 10°C per hour)
 - Short term stability :
Measured in one millisecond, the standard deviation of the frequency is lower than $2 \cdot 10^{-9}$ under an induced environment.

Note : the frequencies F1, F2 and F3 have the accuracy and stability of the reference frequency.

- **Frequency or phase locking (external)**
 - Frequency : 1,5 or 10 MHz
 - Input level : 200 mV to 1 V_{rms}/50Ω. (-1 to $+13$ dBm), without DC current
 - Adaptation attenuation : > 15 dB
 - Phase : master voltage (from the phase comparator) : ± 5 V.
 - Built-in oscillator adjustment : $3 \cdot 10^{-6}$. that is : $-1 \cdot 10^{-6}$ to $+2 \cdot 10^{-6}$. or : $-2 \cdot 10^{-6}$ to $+1 \cdot 10^{-6}$ according to the drift of certain crystals.
 - Locking area : $5 \cdot 10^{-7}$
 - Settling time in normal working conditions : < 1 second.
 - Locking time from cold : 6 minutes.
- **Spectral purity**
 - Harmonics : ≤ -20 dBc (for F1, F2, F3, 5 MHz)
 - Synchronous noise from 10 Hz to 6 MHz.

The SSB phase noise must remain below the following limits :



- Amplitude noise :
 - 75 dB_{rms} for the transposition and video intermediate frequencies (BW : 10 Hz to 6 MHz).
 - 70 dB_{rms} for the audio IF (10 Hz to 30 kHz, non weighed BW).
- F3 (transposition frequency) :
 - 58 dB_{rms} (BW : 10 Hz to 6 MHz)
 - 68 dB_{rms} (BW : 10 Hz to 100 kHz)
- F2 (video frequency)
 - 63 dB_{rms} (BW : 10 Hz to 6 MHz)
 - 68 dB_{rms} (BW : 10 Hz to 100 kHz)

Global noise measured with the TV demodulator (recursive + erratic noise) or signal to noise ratio :

$$\frac{S}{T} = \frac{\text{blanking monochromatic signal (0.7 Vdc)}}{\text{RMS noise}}$$

- **Level**
 - 5 MHz time base : $+7$ dBm ± 1 dB
 - Outputs transposition frequency and IF : 11 to 17 dBm/50Ω
 - Stability : ± 1 dB at 25°C
 - Adaptation attenuation 15 dB

- **Harmonic distortion**

- Time base frequency : ≤ -20 dB
- Transposition frequency and "audio" and "video" IF's : ≤ -20 dB

- **Output signal cut off**

The outputs F1, F2, F3 are automatically inhibited when there is failure. In this case, the residual level is < -20 dBm.

- **Power**

- Voltage : $220\text{ V} \pm 15\%$
- Frequency : 48 to 62 Hz
- Power consumption : 50 VA

- **Battery**

In case of a main failure, the external battery supplies the driver

- Voltage : $11\text{ V} < U < 13\text{ V}$
- Max. current : 150 mA ($T > 20^\circ\text{C}$)
- Starting intensity from cold : 550 mA.

- **Environment**

- Operating temperatures : 0 to $+60^\circ\text{C}$
- Guaranteed performances over a temperature range of $+10$ to $+50^\circ\text{C}$ (temperature gradient lower than 10°C per hour).
- Storage temperature : -20 to $+70^\circ\text{C}$.
- Ambient magnetic inductions : $5 \cdot 10^{-5}$ Tesla rms

- **Dimensions**

- 3μ , 19 inches rack
- Depth : 340 mm
- Weight : 11 kg

