

MULTI-RANGE TELEMETRY RECEIVER

NEMS-CLARKE

TYPE
1037A

Nems-Clarke 1037A Multi-Range Telemetry Receiver provides comprehensive reception capability, achieved by the latest in proven design techniques. An optimum combination of transistor and nuvistor circuitry provides improved performance over existing receivers with much reduced space and power requirements. Modular construction permits wide choices in RF tuning ranges, IF bandwidths, modes of demodulation, and the addition of auxiliary functions.

A basic receiver is now available including the following plug-in modules: RF tuner covering 55 to 2350 mc, IRIG recommended IF bandwidths from 12.5 kc to 1.5 mc with matched FM discriminators, AM detection, and an integral spectrum display unit. Phase lock FM demodulation can be added. A more elaborate model will provide many new capabilities as dictated by users requirements. These include:

1. A phase-lock tracking filter which automatically searches for a signal, locks to the signal when it appears (but will not lock on sidebands of modulated signals), demodulates PM or AM and provides pulse reshaping for PCM signals. Tracking of doppler shifts at

signal strength of -150 dbm is possible.

2. Operation of two or more complete RF tuner IF amplifier systems from common local oscillators for such purposes as predetection diversity combining, RF phase comparison, and monopulse systems. Additional circuitry required for combining or phase comparison can be included in the complete unit.
3. Integral down-converters and up-converters for predetection recording and playback, suitable for various bandwidths and tape speeds.
4. Additional special purpose RF tuners, amplifiers, and demodulators with different IF frequencies if necessary.
5. Special video circuitry, such as demodulators, pulse reshapers, and line-phase filters.

The 1037A Receiver can be built to meet the latest military specifications for ground support equipment. With planned flexibility, small size, and a new level of Nems-Clarke reliability, it is ideal for the latest telemetry space communications needs.



CIRCUIT DESCRIPTION

The basic receiver is a double superheterodyne with IF frequencies of 30 mc and 10 mc. Some applications require a third conversion to 455 kc. Plug-in RF tuners determine the RF tuning range, and plug-in filter-demodulator modules determine

IF bandwidth and type of demodulation. Front panel selector switches control AGC characteristics, slow, pulse and off; Second LO Mode, playback, AFC, VFO and Extal, and Video Bandwidth. Outputs from the first local oscillator

Vitro ELECTRONICS PRODUCERS OF **NEMS-CLARKE** EQUIPMENT
A DIVISION OF VITRO CORPORATION OF AMERICA

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SPECIFICATIONS (cont)

- variation, 1.0 cps to 2.0 mc output level; 10v p-p min at total harmonic distortion of 2% into a 75 ohm load or 20v p-p max into a 1000 ohm load; this output produced by a peak-to-peak deviation of one-fifth of the IF bandwidth
- Low Level AM output:
 - frequency response (detector and amplifier); 3 db max variation, DC to 250 kc output level: 0.6v p-p for 50% modulation at 500 uv R_i input into a 1000 ohm load
- DC FM Output:
 - frequency response, amplifier only; 3 db max variation, DC to 250 kc output level; 4v p-p for p-p deviation equal to IF bandwidth with load of 200 ohms in parallel with 500 pf. DC offset for properly tuned CW signal; ± 1 volt max
- Spectrum Display Output (if integral SDU not used)
 - center frequency; 2 mc
 - bandwidth; 3.5 mc approx
- Frequency Monitor Output:
 - center frequency; 30 mc
- First Local Oscillator Output:
 - frequency same as first LO crystal (or approximately for VFO operation)
 - output level adequate for HP 524C counter
- Predetection Recording Output:
 - center frequency; 10 mc
- Non-limited and limited output:
 - output level; 0.5v p-p min into 50 ohm load
- Signal Strength Record Output:
 - output level; varies from 0 to 4 volts approx for

- 0-100,000 uv signal strength into a 100,000 ohm load
- AFC Characteristics:
 - drift equal to IF bandwidth corrected so that second IF center frequency error is not more than ± 1% of the IF bandwidth for the standard FM discriminators
- AGC Characteristics:
 - four selectable modes of operation; FAST, for normal FM reception SLOW, for AM reception PULSE, for low duty cycle pulsed signals OFF, for noise figure measurements, gain fixed.
- Power Requirements:
 - 117/234 volts, ± 10%, 50 to 450 cps, 50 w max
- Spectrum Display Unit Type SCU 360- Optional
- Sweep Width:
 - variable up to 3 mc
- Resolution:
 - resolves equal amplitude signals separated by 10 kc or more
- Sensitivity:
 - less than 1.0uv at antenna input for full scale deflection
- Display Area:
 - 1 inch high, 2-3/4 inches wide
- Power Requirements:
 - 117/234 volts, ± 10%, 50 to 450 cps, 12w max
- NOTE:
 - Type 1037A Receiver utilizes Type CO-400 Plug-In Crystal Oven Assembly (same as Nems-Clarke 1400 Series Receiver)
 - Please specify exact crystal frequency desired.

