NEMS CLARKE

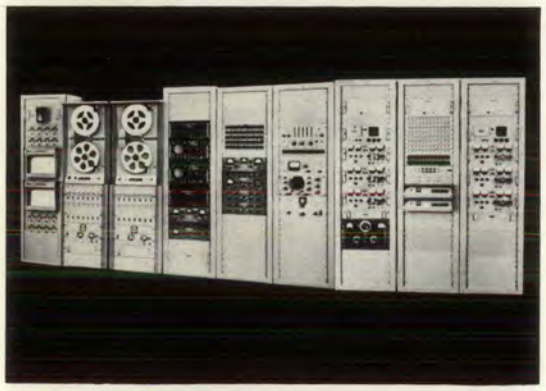
SHORT FORM CATALOG

over 50 years of receiver development

Vitro ELECTRONICS
A DIVISION OF VITRO CORPORATION OF AMERICA
919 JESUP-BLAIR DRIVE
SILVER SPRING, MARYLAND

Vitro ELECTRONICS

A DIVISION OF VITRO CORPORATION OF AMERICA



A new VITRO ELECTRONICS, backed by a heritage of over 50 years of receiver development, has emerged as the leading manufacturer of telemetry and surveillance receivers. This was achieved by continuing to produce, improve, and maintain the high standard of excellence of the original Nems-Clarke equipment line, and at the same time, undertaking a full-scale Company-funded program to advance basic receiver state-of-the-art. One result of this program is the new solid-state/nuvistor Type 1037A Telemetry and Surveillance Receiver which is now in full production. Another is the even more flexible Type 2074 Dual-Channel Receiver for diversity and antenna tracking applications.

Both receivers employ plug-in modular construction throughout, and thus avoid receiver obsolescence. This feature also permits building-block production assembly, thereby allowing an extremely wide variety of receiver requirements to be realized without costly and time-consuming design and development effort.

Other results of this program include a predetection dual-diversity combining and recording system, an integral solid-state down and up converter for predetection recording, an ultra-linear phase demodulator and an anti-sideband phase lock tracking demodulator.

These, as well as all of the VITRO ELECTRONICS products, are manufactured in full accordance with MIL-Q-9858 quality control specifications, utilizing the latest philosophy in workmanship standards for ground support equipment.

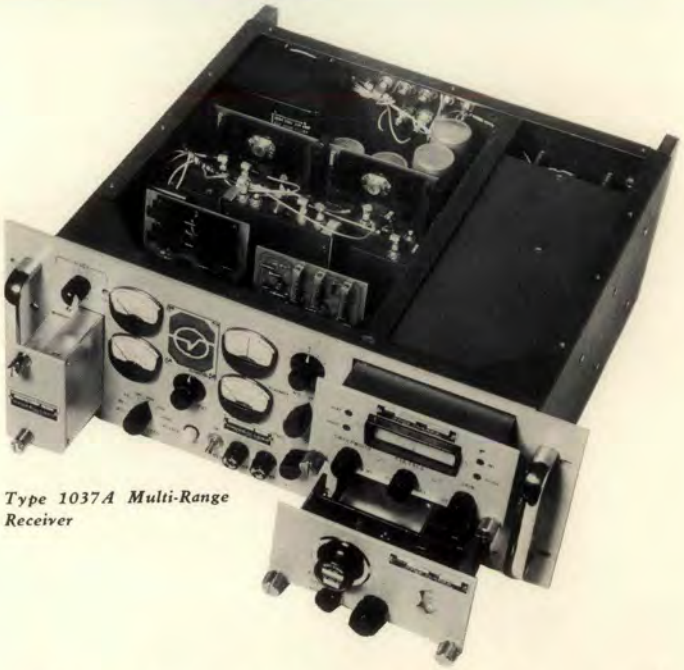
VITRO ELECTRONICS has also successfully demonstrated its ability to procure, design, and manufacture all necessary equipment for telemetry sub-systems, as well as supplying installation and complete check-out supervision. An example of this capability is the complete telemetry system supplied for PMR ships, Huntsville and Watertown, shown in the photograph on the left.

As an operating division of Vitro Corporation of America, VITRO ELECTRONICS offers the resources, integrity, and financial capability of a national organization with more than 4,500 employees, and annual sales exceeding $50 million.

TYPE 1037A — THE WORLD'S MOST ADVANCED VHF/UHF RECEIVER (55 to 2300 mc)

YEARS-AHEAD SOLID-STATE DESIGN TODAY

- Transistorized with Nuvistor Front-Ends
- Wide choice of demodulators: Foster Seeley FM, PM, Phase-Lock FM, Anti-Sideband Phase Lock Tracking, and AM
- Total Modularity — prevents receiver obsolescence
- All IRIG, IF Bandwidths and RF Tuning Ranges
- Complete Predetection Record and Playback Facilities
- Compact — Only 7-inch rack space, including plug-in spectrum display, RF tuner, and demodulator modules
- Cool — only 50 watts total power consumption



Type 1037A Multi-Range Receiver

General Description — The new Nems-Clarke Type 1037A Receiver is specifically tailored for universal telemetry and surveillance applications where highest reliability, minimum power consumption, and space economy are in greatest demand. Maximum RF signal handling capability is insured by an optimum design combination of nuvistors and transistors. Requiring only 7 inches of vertical rack space the Type 1037A accepts an optional plug-in Spectrum Display Unit Type SDU-364, any one of nine front-panel plug-in RF modules covering 55 to 2300 mc, and a choice of ten front-panel plug-in FM demodulators covering all IRIG bandwidths from 12.5 to 2400 kc The 1037A will not only meet standard FM/FM and PDM/FM applications, but PCM/FM requirements as well, in systems using up to one million bits per second.

Optional predetection recording facilities are provided for a single tape recorder center frequency by an integral 1037A plug-in down converter Type DNC-301, and an up converter, Type UPC-301. An external single channel Type COD-1000 Converter/Demodulator described in this catalogue is also available that will down convert for tape recording purposes, up convert from the tape and demodulate the signal without tying up a second receiver. These features also allow real time monitoring of the recording process to ensure proper operation of the tape recorder system. See page 9.

* See Specifications on page 4

RF TUNERS

A choice of nine RF tuners permit operation from 55 to 2300 mc. All tuners offer crystal-control or VFO operation except for the Type RFT-109A, which is not crystal-controlled. The second local oscillator can be switched to crystal-control, VFO or AFC operation. Local oscillator stability is ±0.001% with integral plug-in Crystal Oven Type CO-400 and a Type QC-32A crystal. (For crystal ordering information, please see receiver accessories, page 15. Front panel selectable video cut-off-frequencies are 12.5, 25, 50, 100, 500 and 1000 kc at 18 db per octave rolloff.

Type RFT 100A Series Plug-In Tuner

Chart I — RF Tuner Specifications

MODULE TYPE	TUNING RANGE (mc)**	NOISE FIGURE (db) MAX.	TYPICAL
RFT 109A	55-260*	7.0	6.0
RFT 100A	135-155	5.0	4.5
RFT 101A	215-260	7.0	6.0
RFT 107A	215-315	7.0	6.0
RFT 102A	370-410	8.0	7.0
RFT 103A	920-1000	11.0	10.0
RFT 104A	1435-1535	11.0	10.0
RFT 105A	1700-1850	11.0	10.0
RFT 106A	2200-2300	11.0	10.0

*VFO—not crystal controlled
**Other telemetry and surveillance tuning ranges available on special order

DEMODULATORS

Four types of plug-in demodulators and five detection modes are available with the Type 1037A Receiver: (1) Foster-Seeley FM; (2) Linear Phase; (3) Phase-Lock FM; and (4) Anti-Sideband Phase Lock Tracking. The fifth is conventional AM, which is included as an integral part of the receiver. They are described briefly as follows:

TYPE FSD 100A SERIES FM FOSTER-SEELEY DEMODULATORS

The Type FSD-100A Series plug-in modules determine the operating IF bandwidth of the type 1037A Receiver when demodulating FM signals. Each FM demodulator module contains a separate IF bandwidth filter and an individually matched Foster-Seeley discriminator. Thus, the optimum combination of linearity, sensitivity, and capture ratio is achieved with each bandwidth module selected. The 1037A is the only telemetry or surveillance receiver to offer this feature.

FSD-100A Series Demodulators

Chart II —
Foster-Seeley Type FSD/FM Demodulators

TYPE	BANDWIDTHS
FSD-101A	12.5 kc
FSD-102A	25.0 kc
FED-103A	50.0 kc
FSD-104A	100.0 kc
FSD-105A	300.0 kc

TYPE	BANDWIDTHS
FSD-106A	500.0 kc
FSD-107A	750.00 kc
FSD-108A	1000.0 kc
FSD-109A	1500.0 kc
FSD-110A	2400.0 kc

TYPE PMD-100A AND PMD-100C LINEAR PHASE DEMODULATOR

The Nems-Clarke Type PMD-100A Linear Phase Demodulator provides optimum demodulation of phase modulated signals in the Nems-Clarke Type 1037A Receiver. A narrow band tracking loop in the PMD-100A phase locks the incoming carrier to a reference carrier and a linear phase comparator produces an output voltage proportional to the instantaneous phase difference between incoming and reference signals. Synchronous demodulation of AM signals can be added, making either PM or AM video outputs available from the receiver. Both a visual lock indicator and the audio system of the 1037A Receiver are available as aids for manual locking of the carrier-tracking loop. The receiver's first local oscillator is voltage controlled by the long loop arrangement. Although crystal stabilized, the frequency of this oscillator is pulled by the output from the phase comparator. One unique feature of the phase comparison circuit is its linearity for wide peak phase deviations of ±2.8 radians or ±160 degrees. The Type PMD-100C is identical to the Type PMD-100A except that it uses a Bessel filter in addition to the phase comparison circuit to provide a linear phase IF pass-band. Thus the Type PMD-100C is particularly suitable for multiple subcarrier systems where inherent low intermodulation distortion contributes greatly to system performance.

Physically, the PMD-100A and PMD-100C consist of internal modules installed within the 1037A receiver, plus a special front panel plug-in module used in place of the normal Type FSD or PLD series FM demodulators. With the internal modules installed, the FM demodulator modules still provide normal FM reception when they are plugged in at the front panel. For additional details, please fill out attached inquiry card.

Type PMD-100A Linear Phase Demodulator

SPECIFICATIONS

Carrier Tracking Loop	Second-order loop, bandwidths of 1.0 to 500 cycles per second are available
Tracking Loop Lock Threshold	-145 dbm or less at receiver input for a loop bandwith of 20 cycles per second
PM Video Bandwidth	Low frequency limit, approximately 2 x (loop bandwidth) High frequency limit, determined by pre-detection IF filter; 1.5 mc maximum.
PM Demodulator Linear Range	±2.8 radians (±160 degrees)
Frequency Acquisition and Tracking Range	Determined by receiver circuitry. ±30 kc for 135 to 155 mc tuning heads. This may be extended for other requirements.

TYPE PLD-100A SERIES PHASE-LOCK FM DEMODULATORS

The primary advantage of the PLD-100A Series phase-lock demodulator is that it reduces the FM threshold. This is accomplished by a noise-free, locally generated frequency being mixed with the incoming signal-plus-noise in a product demodulator to produce an improved output signal-to-noise ratio at low signal levels. The frequency of this local oscillator (VCO) is continuously corrected to match the incoming signal's frequency, as the input frequency is deviated, by means of a phase-locked loop. An output from the product demodulator which is proportional to the phase difference between these signals is averaged and used to correct the VCO in such a manner as to keep the locally generated signal in phase synchronism with the input signal. Since the VCO has a linear frequency-versus-voltage characteristic over the frequency range of interest, the voltage applied to the oscillator is proportional to the frequency of the incoming signal. In this manner, output data can be obtained which is essentially identical to the input data.

Type PLD-100A Series Demodulator

Chart III, Phase-Lock
Type PLD FM Demodulators

TYPE	BANDWIDTHS
PLD-101A	12.5 kc
PLD-102A	25.0 kc
PLD-103A	50.0 kc
PLD-104A	100.0 kc
PLD-105A	300.0 kc
PLD-106A	500.0 kc

TYPE PTD-101A ANTI-SIDEBAND PHASE-LOCK TRACKING DEMODULATOR

The Anti-Sideband Phase Lock Tracking Demodulator, Type PTD-101A, is used to demodulate PCM/PM and PCM/AM data and it is based upon an exclusive Nems-Clarke design (patent applied for). Supplied as an external rack mount unit for use with the 1037A Receiver, the PTD-101A automatically searches for and acquires carrier signals as low as -140 dbm. The unique feature of the PTD-101A is that it will lock on the carrier but not the sidebands. The AFC system can also track doppler shifts at signal strengths of -150 dbm at shift rates up to 250 cps and correct for over-all transmitter and receiver drifts as well. It then demodulates PCM/PM or PCM/AM signals and provides both direct or reshaped output data. Acquisition of the signal can either be automatic or manual. With automatic tracking, the unit will search ±5 kc around the carrier frequency. (For additional information, please fill out the reply card in the back of this catalogue.)

AM DEMODULATOR

A standard AM demodulator is included in the basic receiver, since separate plug-in modules are not required. The detected video output is flat within ±3 db from dc to 250 kc.

TYPE SDU-364 SPECTRUM DISPLAY UNIT

The Type SDU-364 is an integral plug-in spectrum display unit specifically designed for use with the Type 1037A Receiver. It provides an extremely convenient and compact visual display of frequency versus amplitude characteristics of received signals and aids in the identification and location of interference sources.

Two unique features include two-to-one improvement in resolution over competitive designs (10 kc vs. 20 kc) and crystal controlled marker pips for accurate sweep calibration. Specifications and additional details may be found on page 11.

Type SDU-364 Spectrum Display Unit

TYPE DNC-301 AND UPC-301 PLUG-IN PREDETECTION RECORDING CONVERTERS

Integral plug-in Type DNC-301 down converters and Type UPC-301 up converters for the 1037A are available for specific tape recorder center frequencies of 900, 600, 450, 225 and 112.5 kc. Please specify center frequency required when ordering.

TYPE 2074 DUAL CHANNEL NUVISTOR/SOLID STATE VHF/UHF RECEIVER (55 to 2300 mc)

- Two Complete Receivers in Only 7" Rack Space
- Nuvistor/Solid-State Design
- Building-Block Modularity Throughout
- Dual Diversity, Conical Scan, and Monopulse Automatic Tracking Applications
- Minimum Design and Development for Specialized Requirements

Type 2074 Dual Channel VHF/UHF Receiver

General Description — The new Nuvistor/Solid-State Type 2074 is a complete dual channel receiver requiring only 7" of vertical rack space. This receiver offers a choice of any two plug-in RF heads covering a frequency range of 55 to 2300 mc in nine bands, two independent IF channels, and two separate video amplifiers. Specifications for each channel are generally the same as for the Type 1037A. The Type 2074 derives its inherent building-block flexibility from the expanded solid-state module design concept of the Type 1037A Receiver. This was achieved by designing the chassis of the 2074 to serve as a basic module receptacle. Since each plug-in module is standard in size and uses the same type of electrical connector, appropriate selection of modules allows an extremely wide variety of receiver characteristics to be realized without expensive and time-consuming design and development. Thus the 2074 can be easily modified to fit many highly specialized applications. For example, this receiver can be plug-in assembled to include any two RF heads for dual-range tuning purposes, and a single first and second IF channel, and one video amplifier. Another module configuration contains one plug-in spectrum display unit, one RF head, and two separate IF channels and two video amplifiers. This combination permits the selection of two simultaneous demodulated IF outputs when two IF demodulators are plugged into the front panel. The Type 2074 can also be supplied with two external 3½ inch plug-in demodulator panels to permit rapid switch selection of any one of six different IF demodulators for each separate receiver channel.

Applications for the Type 2074 include dual channel telemetry and surveillance reception, space/polarization/frequency diversity, conical-scan tracking, and monopulse tracking. When the Type 2074 is used with an external Type DCA-5000 Predetection Dual Diversity Combining and Recording Unit (another Nems-Clarke exclusive described on page 10), a 2.5 db improvement in FM threshold is achieved. However, when this improvement is coupled with the 2.5 to 2.8 db improvement in output signal-to-noise ratio of a two channel combiner over that of a single receiver channel, an over-all system improvement of 5 db near threshold can be expected. An external Dual Channel Down and Up Converter, Type COD-2000 for predetection recording purposes is also available, and this is described on page 9. The Type SDU-362, external plug-in Spectrum Display Unit is described on page 11.

For specific details regarding available IF demodulators, information on dual-diversity reception, or for assistance in applying our highly economical building-block principles to your specialized receiver requirements, please fill out attached inquiry card.

SPECIFICATIONS FOR TELEMETRY RECEIVERS

Type 1037A and 2074 (Each Channel)

Frequency Range	55 to 2300 mc using 9 tuners (See Chart I)
Stability	Crystal: ±0.001% using crystal and oven assembly ±0.005% without oven; VFO: ±.001% per degree C
Type	Double conversion, super-heterodyne; 30 mc first IF, 10 mc second IF
Noise Figure	See Chart I
RF Input Impedance	50 ohms nominal
Image Rejection	60 db (minimum)
IF Rejection	80 db (minimum)
IF Bandwidth	See Charts II and III
Selectivity	Shape factor (60:6 db ratio) 2.8 to 1
Panel Meters	Signal Strength, Deviation, Tuning & Video Output
Video Characteristics	
High-level FM Response	1 cps to 2.0 mc; ±3 db
High-level FM Output	10 v. peak-to-peak into a 75 ohm load, or 20 v. peak-to-peak into 1000 ohm load
Low-level FM Response	dc to 250 kc: ±3db (without AFC)
Low-level FM Output	4 v. peak-to-peak with 2000 ohm load
Low-level AM Response	dc to 250 kc: ±3 db (without AGC)
Low-level AM output (1037)	0.6 v. peak-to-peak into 1000 ohm ac load
AM Output (2074)	10 v. peak-to-peak into 75 ohms, 20 v. peak-to-peak into 1000 ohms
Video Filter	Selectable cut-off frequencies of 12.5, 25, 50, 100, 300, 500, 1000 kc; attenuation slope 18 db per octave.
Predetection Recording Output	10 mc center frequency, limited and non-limited
Test Points	Available on all modules and chassis
Power Requirement — 1037A	117/234 vols ± 10% 50 to 450 cps, 50 watts max.
2074	117/234 volts ± 10% 50 to 450 cps, 80 watts max.
Weight — 1037A	37 pounds maximum
2074	50 pounds maximum
Size — 1037A and 2074	7" high x 19" wide (panel) x 16" deep (over-all)

TYPE 1455-A AND 1456-A—WORLD-WIDE TELEMETRY STANDARDS

PROVEN DESIGN VERIFIED BY HUNDREDS OF DIVERSIFIED APPLICATIONS
UNIVERSAL TELEMETRY RECEIVERS

TYPE 1455A (215 to 260 mc) and
TYPE 1456A (128 to 142 mc)

- Front Panel Plug-in IF Demodulators
- Dual IF Bandwidths — Switch Selectable
- Triple-Mode Detection — AM/FM/Phase Lock, Switch Selectable
- Predetection Record/Playback Facilities

Type 1455A Universal Telemetry Receiver

Nems-Clarke Type 1455A and 1456A multiple bandwidth telemetry receivers operate within the frequency ranges of 215 to 260 mc and 128 to 142 mc, respectively. Each plug-in IF demodulator module is designed to provide a specific bandwidth, from 10 kc to 1.5 mc. All IF modules plug-in from the front panel and can be easily replaced by any one of the other available modules within a minimum of manipulation and time. Operational flexibility is furthered by availability of dual bandwidths in all modules except the Type IFM-10. A front-panel switch selects either of the two bandwidths without affecting performance or interrupting operation of the receiver.

Deviation meter scales on each module provide output voltages and meter deflections that are essentially the same percentage of bandwidth in all modules. All modules have both a Foster-Seeley FM discriminator and an AM envelope detector. In addition, modules with bandwidths of 500 kc and below (except for Type IFM-10) offer phase-lock detection; all switch selectable from front panel.

The six demodular modules are listed in Chart IV below. Signal and power connections are provided through a self-aligning 34-pin connector on the rear apron of the Type IFM demodulator. Each module has its own signal strength and deviation meter, a gain control, and a predetection recording and playback switch. For predetection recording down and up conversion, see the Nems-Clarke Type COD-1000 Converter/Demodulator, described on page 9. Please see Receiver Accessories Section for crystal ordering information.

Type IFM Series Demodulator

CHART IV Type IFM Demodulators

TYPE	BANDWIDTH	DETECTION MODES
IFM-10	10 kc	FM and AM
IFM-30/50	30 or 50 kc	FM, AM, and Phase Lock
IFM-50/100	50 or 100 kc	FM, AM, and Phase Lock
IFM-150/300	150 or 300 kc	FM, AM, and Phase Lock
IFM-300/500	300 or 500 kc	FM, AM, and Phase Lock
IFM-750/1500	750 or 1500 kc	FM and AM

TYPE PTD-100 ANTI-SIDEBAND PHASE-LOCK TRACKING DEMODULATOR

Nems-Clarke's exclusive and highly successful Anti-Sideband Phase-Lock Tracking Demodulator Type PTD-100 is specifically designed for use with PCM/PM or PCM/AM telemetry signals. The Type PTD-100 demodulator plugs into the front-panel of the 1455-A and 1456-A receivers in the space normally provided for IFM demodulator modules. All other characteristics are the same as described under the PTD-101A in the 1037A Receiver section.

When ordering this module to add to existing Type 1455-A and 1456-A receivers, it is necessary to crystal control the second local oscillator. A simple field modification kit (Type OSK-100) is provided for this purpose and should be specified when ordering a Type PTD-100 demodulator. When Type 1455-A or 1456-A receivers are ordered with a Type PTD-100 Demodulator, the receiver is already equipped with a crystal-controlled second local oscillator. (For additional information pertaining to your requirements, please fill out attached reply card.)

Type PTD-100

SPECTRUM DISPLAY

Nems-Clarke Spectrum Display Unit Type SDU-200-3 can be used with the Type 1455-A and 1456-A Receivers to provide a visual indication of the frequency and relative amplitude of received signals. These receivers can also be used with the new compact solid state Type SDU-362 Spectrum Display Unit. See page 11 for details on how multiple sets of spectrum display units can be rack mounted in a single 3½ inch panel.

SPECIFICATIONS FOR TELEMETRY RECEIVER TYPES 1455-A and 1456-A

Frequency Range ..... 128 to 142 mc (Type 1456-A)
215 to 260 mc (Type 1455-A)

Stability ..... ±0.001% using CO-400 crystal oven and Type QC-32A crystal; ±0.005% without oven

Type ..... Double conversion, super-heterodyne; 30 mc first IF, 5 mc second IF

Noise Figure ..... Type 1455-A: less than 8 db
Type 1456-A: less than 6 db

RF Input Impedance ..... 50 ohms nominal

Image Rejection ..... 48 db

IF Rejection ..... 60 db

Outputs ..... 0-11 volts across 5,000 ohm load

Video Frequency Response ..... 3 db maximum 1 cps to 1.2 mc

Video Filter ..... Selectable cut-off frequencies of 20, 50, 100, 300, 500, and 1200 kc; attenuation slope of 6 db per octave

Predetection Recorder Output .... 5 mc center frequency

Power Requirement ..... 117 volts ±10%, 60 cps nominal, 260 watts

Weight ..... 55 pounds

Size ..... 8¾" high x 19" wide (panel) x 16½" deep

SURVEILLANCE RECEIVERS

Vitro Electronics manufactures a wide variety of Nems-Clarke surveillance receivers for critical applications. These equipments have been designed for the high stability and sensitivity necessary to meet the demands of diversified monitoring applications. While manufactured expressly for surveillance work, they can, of course, be used for communications or general-purpose laboratory receivers.

MODULAR RECEIVER TYPE RFT/AMD (30 to 1000 mc)

The Type RFT/AMD Modular Receiver is designed to provide the utmost flexibility in surveillance and communications service. It consists of an Amplifier-Demodulator Chassis (Type AMD) and one or both RFT units; Types RFT-30-260 and RFT-250-1000. Each of the two RFT units contains two separate receivers with overlapping tuning ranges. The RFT-30-260, for example, covers 30 to 110 mc and 90 to 260 mc while the RFT 250-1000 covers 250 to 500 mc and 495 to 1000 mc.

The AMD 21.4 Amplifier/Demodulator Unit accepts any of five Type ADM plug-in IF demodulators, from 15 kc to 4 mc, four of which can be accommodated at any one time. Since each RFT tuner unit consists of a pair of independently operable tuners, four signals can be received simultaneously provided four plug-in IF demodulators are used. Isolation between signals is maintained by an individual stage for each of the four signal paths. For a single plug-in demodulator bandwidth, however, continuous tuning over the entire 30 to 1000 mc range is provided. Audio and video amplifiers are completely transistorized for minimum heat and size and maximum reliability. As with other Nems-Clarke receivers, visual monitoring can be obtained by adding Spectrum Display Units Type SDU-300-7, SDU-350-9, or Solid-State Spectrum Display Unit Type SDU-361.

An analog output voltage proportional to frequency is provided by a multiturn potentiometer geared to the individual tuner gear train. See Chart V for demodulator specifications. For additional information, please fill out attached inquiry card.

Type RFT 30-260

Type AMD 21.4

CHART V TYPE ADM DEMODULATOR SPECIFICATIONS

TYPE	BANDWIDTH	VIDEO FILTER	VIDEO RESPONSE*
ADM-15	15 kc	1, 3, 10 kc	10 cps to 7.5 kc
ADM-50	50 kc	3, 10, 30 kc	10 cps to 25 kc
ADM-500	500 kc	30, 100, 300 kc	10 cps to 250 kc
ADM-2000	2 mc	300, 600 kc, 1 mc	10 cps to 1 mc
ADM-4000	4 mc	300 kc, 1 mc, 2 mc	10 cps to 2 mc

*Between 3 db points, as referenced to 100 cps.

TYPE 1306B SURVEILLANCE RECEIVER (30 to 260 mc)

The new and improved Type 1306B Surveillance Receiver is designed for critical AM, FM, and CW applications in the 30 to 260 mc frequency range. It is extremely sensitive and incorporates two RF stages. The input stage consists of a long-life ceramic planar triode in a grounded-grid configuration. No blower motor is required.

Separate tuners in this receiver cover the 30 to 260 mc and 55 to 260 mc ranges respectively to insure maximum sensitivity and a low noise figure over the entire tuning range.

Four IF strips operate simultaneously, and each has a different bandwidth. The 10 kc bandwidth is designed for AM and CW reception; the 300 kc strip for FM, CW, and pulsed AM; the 500 kc and the 2 mc strips are used for CW and pulsed AM reception. A low-level video output is available from each IF strip simultaneously. In addition, a high-level video output is available from any one IF strip by switch selection. The high-level video output is equipped with variable low pass filtering to obtain maximum signal-to-noise ratio when full video bandwidth is not required. For additional details, please fill out the attached inquiry card.

Type 1306B Surveillance Receiver

PRECISION SURVEILLANCE RECEIVER 1302B (55 to 260 mc)

Type 1302B Surveillance Receiver

This Nems-Clarke receiver is an extremely sensitive and stable AM/FM/CW instrument. It contains two RF stages in its front-end, with an improved ceramic planar triode in a grounded-grid configuration as a first stage. This feature assures that the noise figure will not exceed 6 db at any frequency up to 260 mc. The use of a ceramic tube also eliminates the need for blowers and provides for much longer tube-life than previous designs. The receiver offers selection of 10 or 300 kc IF demodulator bandwidths and can be used with Spectrum Display Unit Types SDU-200-2 or SDU-361. Older Type 1302A receivers can be converted to a Type 1302B, which incorporates the new G. E. improved-life ceramic RF input tube and eliminates the need for a blower motor. Please fill out attached inquiry card for details.

VHF SURVEILLANCE RECEIVERS TYPE 1500A SERIES (55 to 260 mc)

The 1500A Series receivers are more economically priced than the 1302B Receiver and are designed for AM/FM/CW operation in the VHF range. They can also be used for telemetry and as general-purpose receivers. They feature unusual stability, high sensitivity, and offer IF demodulator bandwidths of 175 or 300 kc. Their common 21.4 mc IF outputs make it possible to use Spectrum Display Units SDU-200-2 or SDU-361. Individual 1500A Series receiver specifications are listed in Chart VI.

CHART VI TYPE 1500 SERIES RECEIVER SPECIFICATIONS

TYPE	TUNING RANGE	NOISE FIGURE (Maximum)	BANDWIDTH
1501A	55-260 mc	11.5 db	300 kc
1502A	55-260 mc	6.0 db	300 kc
1509A	55-260 mc	11.5 db	175 kc
1510A	55-260 mc	6.0 db	500 kc
1511A	55-260 mc	6.0 db	175 kc
1512A	55-260 mc	11.5 db	500 kc

Type 1500A Series VHF Surveillance Receiver

TYPE 1670 SERIES GENERAL PURPOSE FM RECEIVERS (55 to 260 mc)

The Nems-Clarke 1670 Series General Purpose Receivers include the types 1671, 1672, 1673, and 1674. They are extremely versatile, high-quality instruments at a very moderate price. These units are designed for FM reception in the frequency range from 55 to 260 mc and are for applications in telemetering, guided missile monitoring and numerous other uses.

Type 1671 and 1673 receivers can be easily converted to crystal control operation by replacing the local oscillator tube with a plug-in Crystal Oscillator Adapter, Type COA-7173 series, listed in the receiver accessories section. Please fill out the attached inquiry card for additional details.

Type 1670 Series General Purpose FM Receivers

SPECIFICATIONS

	1671 (1670-E)	1672 (1670-F)	1673 (1670-G)	1674 (1670-J)
Tuning Range:	175-260 mc	55-260 mc	175-260 mc	55-260 mc
Noise Figure:	10 db maximum	11.5 db maximum	10 db maximum	11.5 db maximum
IF Bandwidth:	500 kc	500 kc	300 kc	300 kc

TYPE 1412 AND 1432 GENERAL PURPOSE TELEMETRY RECEIVERS

Type 1412 Telemetry Receiver

The Type 1412 and 1432 Receivers are crystal controlled, double conversion superheterodynes designed for FM reception, with a noise figure of less than 8 db. They differ only in that the 1412 uses a Foster-Seeley discriminator and the 1432 uses a phase lock detector. The low noise figure is achieved by using a grounded-grid RF amplifier, followed by a triode-connected mixer. These receivers offer a choice of two second IF amplifiers of different bandwidths, which can be selected by means of a front-panel switch. The wide-band IF amplifier is 500 kc at the 3 db points with 60 db attenuation 500 kc each side of center frequency. The second IF amplifier is 100 kc with better than 60 db attenuation 250 kc each side of center frequency. Variable frequency tuning over the 215 to 260 mc range can be provided by an optional Type VF-1400A VFO unit that plugs into the front panel crystal socket. This item is listed in the accessories section. Types SDU-200-3 or SDU-362 Spectrum Display Units are recommended with these receivers.

UHF SURVEILLANCE RECEIVER 2801B (250 to 1000 mc)

The Nems-Clarke 2801B is a recently improved two-band surveillance receiver covering 250 to 500 mc in Band A and 500 to 1000 mc in Band B. Its AM/FM/CW capability and its dual IF bandwidths of 200 kc and 1 mc for both AM and FM permit it to be used in a wide variety of monitoring and UHF data acquisition applications. An added feature is its carrier-operated relay, which can be used to actuate auxiliary recording devices upon reception of predetermined signal levels. This receiver uses the Type 350-8 or the new solid-state SDU-361 Spectrum Display Unit.

Type 2801B UHF Surveillance Receiver

SPECIFICATIONS FOR UHF SURVEILLANCE RECEIVER TYPE 2801B

Frequency Range ..... Band A 250-500 mc
Band B 500-1000 mc
BFO ..... Tunable from front panel
Video Response ..... 3 db from 50 cps to 500 kc
Noise Figure ..... 10 db maximum Band A
12 db maximum Band B
Video Filter ..... 200 kc, 1 mc
IF Rejection ..... 65 db minimum, Bands A and B
Image Rejection ..... 40 db minimum Band A
50 db minimum Band B
IF ..... 21.4 mc

TYPE REU-300-C RANGE EXTENSION UNIT (250 to 900 mc)

The Nems-Clarke Type REU-300C Range Extension Unit provides an accurate and dependable range extension facility to any Nems-Clarke receiver capable of tuning to 60 mc. The REU-300C extends the frequency range from 250 mc to 900 mc in two bands; 250 to 475 mc and 475 to 900 mc.

When this unit is used with Nems-Clarke receivers tuning from 55 to 250 mc, the total tuning range covers 55 to 900 mc. This is a high-quality RF tuner with a single IF output stage. All RF circuitry is contained in shielded sub-assemblies with mechanical rigidity and high electrical stability. Proven circuitry insures low noise figures, good sensitivity, and high selectivity.

Type REU-300C
Range Extension Unit

SPECIFICATIONS

Frequency Range	250 to 475 mc and 475 to 900 mc
Noise Figure	10 to 12 db Average
Gain	10 to 12 db Average
IF Output Frequency	60 mc
Input Impedance	50 ohms unbalanced
Output Impedance	50 to 60 ohms unbalanced
IF Rejection	60 db minimum
Image Rejection	40 db minimum
Power Requirements	110/220 volts AC, 50 to 400 cps, 25 watts
Weight	20 pounds
Size	19" x 7" x 12"

TYPE COD-1000 AND COD-2000 PREDETECTION RECORDING CONVERTER/DEMODULATORS

The Type COD-1000 Single Channel and Type COD-2000 Dual Channel Converter/Demodulators are extremely flexible units that can be used with Nems-Clarke Type 1037, 2074, and 1400 Series Receivers, or any standard telemetry or surveillance receiver employing 10 or 5 mc second IF's. Either one or two complete predetection converter/demodulator units can be housed in a standard 19" by 5¼" panel assembly. Each converter/demodulator contains integral plug-in down and up converter modules, a limiter module, a filter and IF demodulator, a video amplifier with selectable bandwidths, (such as used in the 1037A Receiver), and a power supply.

The converter/demodulator can be used to down convert for tape recording purposes, up convert from the tape and demodulate the signal without tying up a second receiver. These unique features also allow real time monitoring of the recording process to ensure proper operation of the tape recorder complex.

Type COD-2000 Dual Channel
Converter/Demodulator

The use of separate LO's in the converters is an addtional advantage which permits down conversion from one receiver IF and up conversion to another, as may be required when different types of receivers are employed. For additional details pertinent to your requirements, please fill out the attached inquiry card.

SPECIFICATIONS

Down Converter

Input Impedance — 50 ohms
Output Impedance — 75 ohms
Output Level — 1 volt rms max.
Local Osc.—Crystal Controlled
Output Center Frequency —
112.5 kc ±75 kc
225 kc ±150 kc
450 kc ±300 kc
900 kc ±600 kc
Osc.—Crystal Input Level—
0.5 volt peak to peak (nominal)

Up Converter

Input Impedance — 75 ohms
Output Impedance — 50 ohms
Local Osc.—Crystal Controlled
LO Rejection — 40 db minimum
Image Band Rejection — 35 db minimum

TYPE DCA-5000 PREDETECTION DUAL-DIVERSITY COMBINING AND RECORDING SYSTEM

The Nems-Clarke Type DCA-5000 Predetection Dual Diversity Combining and Recording System is specifically designed to operate with the Nems-Clarke Type 2074 Dual-Diversity Receiver, and provides a 2.5 db improvement in FM threshold over conventional post-detection methods. This results from the fact that combining is performed prior to detection, thus inherent detector distortion and detector losses, which would otherwise deteriorate the signal-to-noise, are avoided. When this improvement is coupled with the 2.5 to 2.8 db improvement in output signal-to-noise ratio of a two channel combiner over that of a single receiver channel, an over-all system improvement of 5 db near threshold can be expected. This is accomplished by adding the IF outputs of the diversity receiver in exact phase through a phase-correcting network included in the combiner. Applications include space/polarization/and frequency diversity.

The combined output center frequencies are switch selectable at 900, 600, 450, or 225 kc, which correspond to the center frequencies of standard tape recorders. Video outputs from prerecorded or real time data are also switch selectable through a special wide-band FM demodulator. Although the DCA-5000 is normally used with the new Nems-Clarke Type 2074 dual-diversity receiver, any standard telemetry or surveillance receiver can be used with only minor modifications to the combiner and receiver. This system also offers many significant improvements in tropo-scatter and HF communications. For additional details, please fill out one of the attached inquiry cards.

Type DCA-5000 Predetection Diversity Combiner

TYPE DCA-500A AND DCA-1000A POST DETECTION DIVERSITY COMBINERS

Nems-Clarke Type DCA-500A dual channel and DCA-1000A four channel post detection diversity combiners provide near optimum combining of either two or four receiver outputs. Both units are designed for use with Nems-Clarke 1400 Series Receivers, which contain the same signal information but are fed from different antenna locations or polarizations. When two such signals are fed to the combiner inputs, the single combined video output will have a signal-to-noise ratio at least as high as that of the cleanest input. When all input signal-to-noise ratios are equal, the output signal-to-noise ratio is higher than that of any single input. Typical S/N improvements for equal input S/N ratios are: 5 to 6 db for four inputs, 4 to 4.7 db for three inputs, and 2 to 3 db for 2 inputs.

Electronic combining techniques enable fast response to fluctuations in signal-to-noise ratios. Both input and output fail-safe circuits are used, making complete loss of data due to combiner failure an extremely remote possibility. The DCA-500A and DCA-1000A are designed to handle FM/FM, and PDM/FM telemetry signals, and both can be modified to handle non-standard signals. For additional details, please fill out the attached inquiry card.

Type DCA-1000A Post Detection Diversity Combiner

SPECTRUM DISPLAY UNITS TYPES SDU-200, SDU-300, SDU-350

Nems-Clarke SDU-200, SDU-300, and SDU-350 Spectrum Display Units are heterodyning receivers that display signals from associated telemetry and surveillance receivers on a cathode ray tube. Frequency and relative amplitude of received signals can be determined by the calibrated CRT screen. Signal resolution is 20 kc.

Visual display permtis continuous surveillance and rapid monitoring of all signals within the system bandwidth. Once monitored, a signal can be centered and expanded for further examination. If desired, up to four receivers can be monitored by a single SDU using a type SWK, 4-position coaxial switch assembly, listed in the accessories section.

Since the usable bandwidth available at the SDU output of the receiver is considerably less than the desired SDU sweep width and varies between receiver types, a compensated broad band amplifier is built into the SDU to match the response of specific receivers.

Type 350 Series Spectrum Display Unit

Consequently, several SDU models are available to match individual receivers as shown in Chart VII.

The SDU-200 and SDU-300 series display units are similar except for sweep range. The SDU-200 series provides a 2 mc sweep and SDU-300 series a 3 mc sweep. Each of these units is available for either 21.4 or 30.0 mc input signal operation. The SDU-350 series requires only 3½" of vertical rack space, while 200 and 300 series requires 7".

CHART VII
NEMS-CLARKE RECEIVERS AND ASSOCIATED SPECTRUM DISPLAY UNITS

RECEIVER TYPE NO.	SDU INPUT FREQUENCY (mc)	SDU TYPE*
1037A	30.0	364 plug-in or 362 for eternal panel mount
1302B, 1670 Series, and 1500 Series	21.4	200-2 or 361
1412, 1432, 1455A, and 1456A	30.0	200-3, 300-3, or 362
2074	30.0	362 for external panel mount only
2801B	21.4	350-8 or 362
AMD/RFT 30-1000	21.4	300-7, 350-9 or 361
1306B	21.4	200-6, 300-6, 350-6, or 361

*-2, -3, etc. are frequency compensation suffixes.

SPECIFICATIONS

Maximum Sweep Width ..... SDU-200: 2 mc
SDU-300: 3 mc
SDU-350: 3 mc
Sweep Rate ..... 30 cps
Input Frequency ..... 21.4 mc or 30.0 mc, depending upon receiver type specified
IF Amplifier Frequency ..... 4.3 mc
Sensitivity for Full Deflection ..... 5 uv into receiver

Signal Resolution ..... 20 kc
Power Input ..... 115 volts AC/50 to 60 cps (115/230 volts for SDU 350)
Weight ..... SDU-350: 24.5 lbs.
SDU-200 and 300: 23 lbs.
Size ..... SDU-200 and 300: 13"x19"x7"
SDU-350: 13"x19"x3"

TYPE 360 SERIES UNIVERSAL SOLID-STATE SPECTRUM DISPLAY UNITS

The Nems-Clarke Universal 360 Series Solid State Spectrum Display Unit may be used with any standard telemetry or surveillance receiver. They provide a visual display of frequency vs. relative amplitude of received signals on a cathode ray tube and aid in the identification and location of various interference sources.

Three unique features not available with competitive equipment are (1) crystal-controlled marker pips for accurate calibration of the frequency display, (2) a 2:1 resolution improvement (10 vs. 20 kc) over conventional designs without any reduction in the display area, and (3) its small size and self-contained power supply permit plug-in operation

Type SDU-360 Series Spectrum Display Unit

of 1, 2, or 3 units in a single Nems-Clarke Type ET-105 3½" accessory rack tray. When one or two SDU's are used with the ET-105 rack tray, each unit can monitor up to four receivers with an accessory plug-in 4-position coaxial switch panel assembly. For details see Receiver Accessories, page 15.

SPECIFICATIONS

Input Center Frequency:
(Corresponds to first IF of receiver)
Type SDU 361
21.4 mc
Type SDU 362
30.0 mc
Type SDU 363
60.0 mc
Type SDU 364*
30.0 mc
Maximum Sweep Width: 4.0 mc
Sweep Rate: 20 cps
IF Amplifier Frequency: 21.4 mc, 4.3 mc, and 455 kc

Sensitivity for Full Deflection: 5 uv
Signal Resolution: 10 kc
Control Markers: 21.4 mc with sideband markers at 500 kc intervals. Other frequencies available from 300 kc to 1.5 mc upon request.
Power Input: 115/220 vac, 50/400 cps, 12 watts
Size: 13½" x 6½" x 3½"

*Used with Nems-Clarke Type 1037A receiver only.

SOLID STATE PREAMPLIFIER TYPE SSP-101 (225 to 260 mc) SSP-136 (134 to 138 mc)

The principal advantages of the Nems-Clarke Type SSP-101 and SSP-136 solid state preamplifiers over conventional tube designs are: extremely small size, freedom from maintenance, and ease of installation. The units are designed for close proximity mounting to the antenna and power is obtained by simply feeding the required DC voltage through the RF coaxial cable. These preamplifiers are recommended where inband and adjacent channel interference signals do not exceed one volt rms. Signals above this level will occasionally damage the input transistor or restrict the use of the preamplifier due to limited signal handling capability of the input transistor. If this condition should exist, optional band pass filters Type BPF-237, for the SSP-101, and Type BPF-136, for the SSP-136, should be installed at the preamplifier input. Request specific details on attached reply card.

Either the SSP-101-PA Power Adapter or the SSM-101 or SSM-136 Solid State Multicouplers will power both types of preamplifiers. Each module provides 25 db minimum gain, a noise figure of less than 4.5 db, and an output impedance of 50 ohms. Rack mounting of from one to four Type SSP-101-PA Power Adapters is possible with the appropriate rack tray assembly Type ET-101 through ET-104, listed in the Receiver Accessories Section.

Type SSP-101 Solid State Preamplifier

Type SSP-101PA Power Adapter

TYPE PR-203B PREAMPLIFIER (215 to 260 mc)

The Nems-Clarke Type PR-203B is a recently improved preamplifier and is recommended in telemetry receiving installations where maximum signal handling capability, superior performance and dependability, plus immunity to weather and corrosive atmospheres are required. Like the PR-203A, it incorporates a new long-life ceramic RF input tube which does not require a blower motor. However, the PR-203B incorporates two pairs of triple-tuned circuits. For comparison purposes, this results in 45 db attenuation at 300 mc vs. only 30 db attenuation at 300 mc for the PR-203A.

Maximum noise is 4.5 db and response is flat within 3 db over the 215 to 260 mc pass band. Maximum gain is 20 db, and all units are supplied with sun-shields.

A remote rack mounted power supply with special power regulation is supplied with this preamplifier. Solid state multicoupler Type SSM-101 is recommended with this preamplifier for optimum isolation between any two outputs. A special Kit Type PRK-203B is also available to convert Type PR-203 preamplifiers to a PR-203B for improved tube life and elimination of the blower motor. Models with pass bands between 55 and 500 mc are available on special order.

Type PR-203B Preamplifier

TYPE SSM-101 AND SSM-136 SOLID STATE MULTICOUPLERS —(SSM-101 225 to 260 mc) (SSM-136 134 to 138 mc)

SSM-101 and SSM-136 Solid State Multicouplers are specifically designed to accept the output of antenna mounted solid state preamplifier Types SSP-101 or SSP-136, or the improved ceramic tube Type PR-203B or PR-203A. Each model provides eight isolated outputs from a single 50 ohm telemetry antenna with 56 db minimum isolation between any two outputs. These multicouplers have self-contained power supplies and can also energize solid state preamplifiers through the coaxial RF lead. They are designed for standard rack mounting and require only 10 watts from a 110 volt AC, 60 cycle source. Models with pass bands between 55 and 400 mc are available on special order.

SSM-101 Solid State Multicoupler

TYPE PLR-100 PULSE RESHAPER AND LINE DRIVER AMPLIFIER

The Nems-Clarke Type PLR-100 is a transistorized Pulse Reshaper and Line Driver Amplifier with self-contained power supply. It is designed to reshape either positive or negative pulses from 0.3 to 10 volts in amplitude. Output pulses of 0-4 volts are reshaped and are clean of extraneous signal content picked up below the noise level. Improvement for a pulse having one microsecond rise time is 80 per cent.

The PLR-100 has a scaled meter and input level control potentiometer on the front panel. Power requirements are 115/220 volts AC 60 cycles, 8 watts. Rack mounting of from one to four units is accomplished through the use of an appropriate rack tray assembly Type ET-101 through ET-104. (See Receiver Accessories Section for details.)

Type PLR-100 Pulse Reshaper and Line Driver Amplifier

SPECIFICATIONS

Gain;
Based upon 0.3 volt minimum input, maximum output is 4 volts

Input Impedance;
70 ohms

Output Impedance;
75 ohms ±10%

Minimum Pulse Width;
1 us

Maximum Pulse Width;
1 ms

Maximum Duty Cycle;
68%

Size;
7½"x4"x3¼"

Net Weight;
2½ lbs.

Minimum Repetition Rate;
50 pps

Maximum Repetition Rate;
800K bit PCM

Maximum Rise and Delay Time;
0.3 us

Output DC coupled DC Level;
0-0.5 v (no signal)

Output Pulses;
0-4 volt

TYPE LDA-101 LINE DRIVER AMPLIFIER

The Nems-Clarke solid state line driver amplifier Type LDA-101 with self-contained power supply is a highly versatile booster amplifier for video signals covering a range of from 5 cps to 1.5 mc. It may be used to amplify video information fed over long coax runs of up to 4,000 feet or as a distribution amplifier to provide many isolated outputs from a single video source.

Rack mounting of one to four individual amplifiers is accomplished by using an appropriate 3½" rack tray assembly Type ET-101 through ET-104. See receiver accessory section for details.

Type LDA-101 Line Driver Amplifier

SPECIFICATIONS

Frequency Response	±1 db from 5 cps to 1.5 mc
Rise Time	0.15 microseconds into resistive load
Input Impedance	1K to 3.5K depending upon gain control setting. Terminals provided for mounting load resistor as required for line termination.
Load Impedance	50 to 70 ohms
Output Level	7.0 volts rms maximum (20v p-p) into 50 ohm load
Input Level	4 volts rms maximum (11.3v p-p)
Voltage Gain	3.3 times (10 db), reducible with front panel level control
Harmonic Distortion	1.5% maximum at 5.0v rms
Noise	65 db or better below maximum output level
Supply Requirements	115/230 volts, 50/60 cps, 8 watts with max. signal
Size	7½" long, 4" wide, 3¼" high
Net Weight	2½ pounds

TYPE ER-1001 TELEMETRY EQUIPMENT RACK

The Type ER-1001 Telemetry Equipment Rack is designed for installation as part of an over-all telemetry instrumentation system consisting of various units of equipment electrically connected to function as a single telemetry receiving system with provisions for connection to an external tape recording facility.

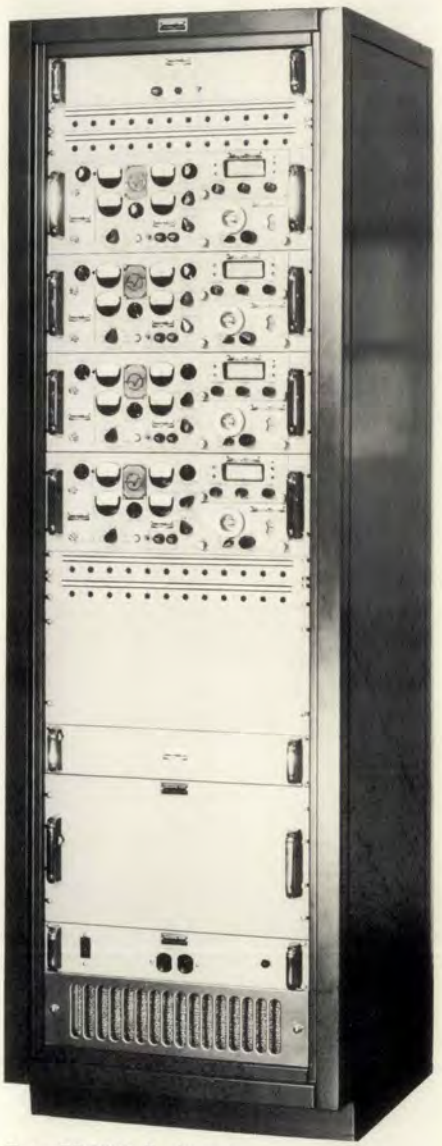
Although other types of equipment configurations can be readily accommodated, the rack shown consists of the following items:

- 4 1037A Receivers with plug-in modules
- 1 SSM-101 (solid state multicoupler)
- 4 921 Patch Panels (Nems-Clarke)
- 1 PCP-100 (power control panel)
- 1 CSD-180 (crystal storage drawer)
- 1 SD-100 (module storage drawer)

The units are grouped functionally in the cabinet to provide logical access to front panel controls. Inputs and outputs to the various components are connected to jacks in the patch panels provided. This allows the operator to set up any equipment configuration by means of front panel switches, patch cords, or plug-in modules for increased system capability.

The antenna receptacle is mounted on a special bracket inside the rack with either an HN or N connector fitting to accommodate the feedline from the antenna or preamplifier. The cabinet is equipped with a McLean type 2E300A blower to provide more than adequate circulation required for maintaining the equipment operation within normal temperature limits. It may be of interest to note that four Type 1037A receivers require approximately the same power to operate as one conventional tube type receiver.

This cabinet is supplied with all units rack mounted and wired. Equipment units may be mounted with lock type slide assemblies, allowing the unit to be pulled out and rotated 45 or 90 degrees for maintenance or calibration. The cabinet has a full-length rear access door to facilitate removal, installation, wiring, or maintenance of the mounted units. Please write for information or assistance concerning your specific requirements.



Type ER-1001 Equipment Rack

SPECIFICATIONS

Dimensions	78⅝"x26-1/16" over-all 70" x 19"
Weight	585 pounds (approximately)
Power	320 watts
Heat Dissipation	250 watts
Power Input	115 vac 60 cps

TYPE SD-100 MODULE STORAGE DRAWER

The Nems-Clarke Type SD-100 Module Storage Drawer provides storage for spare modules for the 1037A and 2074 series receivers. It will accommodate RF tuning heads, FSD and PLD type modules. In addition, crystals, service cables, or spare parts may also be stored. The drawer comes equipped with non-tiltable slides for rack mounting.

SPECIFICATIONS

Dimensions	10½" x 15" x 19"
Finish	Gray enamel, MIL-E-15090, Color No. 26329 Federal Standard 595
Weight	18 pounds

TYPE PCP-100 POWER CONTROL PANEL

The Nems-Clarke Type PCP-100 Power Control Panel is designed for rack mounting. It is equipped with a rear apron having both top and bottom dust covers which provide for maximum safety to equipment and operating personnel. Flush mounted input and output receptacles are located on the rear apron. The front panel has a flush mounted convenience outlet, a combination circuit breaker on-off switch, and a high brightness neon glow lamp.

SPECIFICATIONS

Dimensions	3½" x 19" x 5½"
Finish	Gray enamel, MIL-E-15090. Color No. 26329 Federal Standard 595
Weight	5 pounds
Power Requirements	115 vac 60 cps 1 phase

RECEIVER ACCESSORIES SECTION

CRYSTALS, OVENS, HOLDERS, ADAPTERS, AND PLUG-IN VFO'S

Type CO-400 Crystal and Oven Assembly — Including QC-32A Crystal with ±0.001% stability (customer to specify operating frequency of receiver). Used with all Type 1037, 2074 and 1400 series receivers.

Type QC-32A Quartz Crystal Only — In Type H6/U case (customer to specify desired operating frequency of receiver). Stability is ±0.005% without oven. Used with all Nems-Clarke Type 1037, 1400, and 2074 Receivers. Crystal must be plugged into appropriate CA-100 or CA-101 adapter listed below.

Type CA-100 Plug-In Crystal Adapter for QC-32A Crystal—Used with all 1400 Series Receivers.

Type CA-101 Plug-In Crystal Adapter for QC-32A Crystal—Used with all 1037, 1074, and 2074 Series Receivers.

Type CO-400 Crystal Oven Assembly — Without QC-32A Crystal.

Type COA-7173-1 Crystal Oscillator Adapter — 175 to 193.2 mc, including one crystal, used with Type 1671 to 1673 General Purpose Receivers.

Type COA-7173-2 Crystal Oscillator Adapter — 192.0 to 212.2 mc, including one crystal — used with Type 1671 or 1673 General Purpose Receivers.

Type COA-7173-3 Crystal Oscillator Adapter — 211.0 to 237.2 mc, including one crystal — used with Type 1671 or 1673 General Purpose Receivers.

Type COA-7173-4 Crystal Oscillator Adapter — 236.0 to 260 mc, including one crystal — used with Type 1671 or 1673 General Purpose Receiver.

Type VF-1400A Variable Frequency Plug-In Oscillator — Used with Type 1412 and 1432 Receivers. Frequency range covers 215 to 260 mc for both receivers.

RACK TRAYS

Types ET-101, ET-102, ET-103, and ET-104 — For respective rack mounting of one, two, three, or four of the following standard units: SSP-101-PA Power Adapter Unit for SSP-101 and SSP-136 Solid State Preamplifiers; Type PLR-100 Pulse Reshaper and Line Driver Amplifier; and Type LDA Line Driver Amplifier. Tray size: 3½" x 19".

Type ET-105 — For use with one, two, or three Type 361, 362, or 363 SDU's. Accommodates three SDU-360 Series modules without selector switch module, one SDU-360 Series and single Type SWM-100, 4-position coaxial switch module, or two SDU-360 Series modules and one SWM-200, double 4-position coaxial selector switch module. Tray size: 3½" x 19".

SWITCH MODULES AND SWITCH PANELS

Type SWM-100 Single 4-position Plug-In Coaxial Switch Module — For use with Type ET-105 rack tray. Permits monitoring of up to four receivers with one Type SDU-360 Series plug-in unit.

Type SWM-200 Double 4-position Plug-In Coaxial Switch Module — For use with Type ET-105 rack tray. Permits monitoring of up to eight receivers with two Type SDU-360 Series plug-in units.

Type SWK-100 Single 4-position Coaxial Switch — Permits one SDU-200 or 300 Series unit to monitor up to four receivers.

Type SWK-101 Single 4-position Coaxial Switch — Permits one Type SDU-350 Series unit to monitor up to four receivers.

MODIFICATION KITS

Type OSK-100 Oscillator Kit — Converts the second LO of 1455A and 1456A Receivers to crystal controlled operation and used with Type PTD Anti-Sideband Phase Tracking Demodulator.

Type PRK-203B — Converts older Type PR-203 Preamplifiers to a PR-203B, which incorporates a new and improved-life G.E. ceramic RF input tube and eliminates the need for a blower motor.

Type "JA" Tuner — Converts Surveillance Receiver Types 1302A, 1306A, 1502A, 1501A and 1511A to "B" models. This kit replaces the Western Electric 416B tube with the improved-life G.E. Ceramic RF input tube and eliminates the blower motor.

TEST CABLES

Type TCK-101 — Consists of a set of jumper cables which allow plug-in RF tuners, FSD demodulators, and PLD demodulators, used with the 1037A Receiver, to be tested outside of their respective plug-in receptacles.

JACKS AND PLUGS

Video and RF Jacks, Jack Panels and Plugs — A complete line of Video and RF Jacks, Jack Panels, Plugs and Patch Cables are manufactured by Vitro Electronics. For details, please ask for Video and RF Jack Panel Brochure on attached inquiry card.

RACK SLIDES

Type SL-100 Pull-Out Slides with Tilt Lock — Provides convenient mounting facilities for Nems-Clarke receivers in standard equipment racks. They consist of two pairs of runners mounted on the receiver chassis and two pairs of slides mounted on each side of the rack.

SPARE PLUG-IN MODULES

A complete line of spare plug-in external and internal modules for the Type 1037, 1074 and 2074 Series Receiver are available to simplify spare parts inventory and to facilitate rapid repairs.

Vitro ELECTRONICS
A DIVISION OF VITRO CORPORATION OF AMERICA

PRODUCERS OF **NEMS-CLARKE** EQUIPMENT

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919 Jesup Blair Drive — Silver Spring, Maryland
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PRICES AVAILABLE ON REQUEST. PLEASE WRITE FOR SPECIFIC QUOTATION.

Prices and specifications are subject to change without notice.

PLEASE SEND ME MORE INFORMATION ON THE FOLLOWING ITEMS:

- ☐ Type 1037A VHF/UHF Receiver
- ☐ Type RFT-100A Series Tuners
- ☐ Type FSD 100A Series Demodulators
- ☐ Type PMD 100A and 100C Demodulators
- ☐ Type PLD-100A Phase-Lock Demodulators
- ☐ Type PTD-101A Phase-Lock Tracking Demodulators
- ☐ Type DNC-301 and UPC-301 Converters
- ☐ Type 2074 Dual Channel Receiver
- ☐ Type 1455-A and 1456-A Receivers
- ☐ Type PTD-100 Phase-Lock Tracking Demodulator
- ☐ Type 1306B Surveillance Receiver
- ☐ Type 1302B Surveillance Receiver
- ☐ Type 1500A Series Surveillance Receivers
- ☐ Type 1670 Series General Purpose Receivers
- ☐ Type 1412 and 1432 Receivers
- ☐ Type 2801B UHF Surveillance Receiver
- ☐ Type REU-300-C Range Extension Unit
- ☐ Type COD-1000 and COD-2000 Pre "D" Recording System
- ☐ Type DCA-5000 Pre. "D" Combining & Recording System
- ☐ Type DCA-500A and DCA-1000A Post Detection Combiners
- ☐ Type SDU-200, 300 and 350, Spectrum Display Units
- ☐ Type 360 Series Spectrum Display Units
- ☐ Type SSP-101 and SSP-136 Solid State Preamplifiers
- ☐ Type PR-2038 Preamplifier
- ☐ Type SSM-101 and SSM-136 Solid State Multicouplers
- ☐ Type PLR-100 Pulse Reshaper and Amplifier
- ☐ Type LDA-101 Line Driver Amplifier
- ☐ Type ER-1001 Telemetry Equipment Rack
- ☐ Crystals, Ovens and Holders
- ☐ Rack Trays
- ☐ Switch Modules and Switch Panels
- ☐ Modification Kits
- ☐ Test Cables
- ☐ Rack Slides
- ☐ Jacks and Plugs
- ☐ Spare Plug-In Modules
- ☐ Other Items _____

_____

Name & Title _____

Company _____

Address _____

City _____ State _____

Please Print

PLEASE SEND ME MORE INFORMATION ON THE FOLLOWING ITEMS:

- ☐ Type 1037A VHF/UHF Receiver
- ☐ Type RFT-100A Series Tuners
- ☐ Type FSD 100A Series Demodulators
- ☐ Type PMD 100A and 100C Demodulators
- ☐ Type PLD-100A Phase-Lock Demodulators
- ☐ Type PTD-101A Phase-Lock Tracking Demodulators
- ☐ Type DNC-301 and UPC-301 Converters
- ☐ Type 2074 Dual Channel Receiver
- ☐ Type 1455-A and 1456-A Receivers
- ☐ Type PTD-100 Phase-Lock Tracking Demodulator
- ☐ Type 1306B Surveillance Receiver
- ☐ Type 1302B Surveillance Receiver
- ☐ Type 1500A Series Surveillance Receivers
- ☐ Type 1670 Series General Purpose Receivers
- ☐ Type 1412 and 1432 Receivers
- ☐ Type 2801B UHF Surveillance Receiver
- ☐ Type REU-300-C Range Extension Unit
- ☐ Type COD-1000 and COD-2000 Pre "D" Recording System
- ☐ Type DCA-5000 Pre. "D" Combining & Recording System
- ☐ Type DCA-500A and DCA-1000A Post Detection Combiners
- ☐ Type SDU-200, 300 and 350, Spectrum Display Units
- ☐ Type 360 Series Spectrum Display Units
- ☐ Type SSP-101 and SSP-136 Solid State Preamplifiers
- ☐ Type PR-2038 Preamplifier
- ☐ Type SSM-101 and SSM-136 Solid State Multicouplers
- ☐ Type PLR-100 Pulse Reshaper and Amplifier
- ☐ Type LDA-101 Line Driver Amplifier
- ☐ Type ER-1001 Telemetry Equipment Rack
- ☐ Crystals, Ovens and Holders
- ☐ Rack Trays
- ☐ Switch Modules and Switch Panels
- ☐ Modification Kits
- ☐ Test Cables
- ☐ Rack Slides
- ☐ Jacks and Plugs
- ☐ Spare Plug-In Modules
- ☐ Other Items _____

_____

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