



Technical Data Sheet

S171-ADN Simplex UHF Receiver-Transmitter

DIRECT REPLACEMENT FOR:

Direct form/fit/function replacement for the following out-of-production, legacy radio sets:

NSN	Collins PN	Nomenclature	Power
5821-01-048-7349	622-1589-012	RT-1258(V)	DC
5821-01-034-0209	622-1589-004	RT-1258(V)	DC
5821-01-044-6368	622-1561-012	RT-1266(V)	AC
5821-01-037-7491	622-1561-004	RT-1266(V)	AC

Contact the supplier for information on tailoring the S171-ADN to replace other versions of the ARC-171 family.

KEY FEATURES

- 225-400 MHz tuning range
- Independent/autonomous receiver and transmitter can operate simultaneously
- Switched receive/transmit on one antenna
- Form/fit/function replacement for ARC-171 -1C including adapter tray
- High linearity, low-noise 100 watt amplifier
- Both DC, single phase and three phase 47-420 Hz AC power supply options available
- Tracking preselector and postselector
- Serial synchronous control
- AM/FM narrowband modes using a Software Defined Radio (SDR) module
- Quiet internal reversible/removable blower

DESCRIPTION

The S171-ADN is a form/fit/function replacement for the ARC-171 -1C simplex receiver-transmitter. Using the latest in modern technology, the S171-ADN matches or better the performance, weight and power of its predecessor while retaining plug compatibility.

The S171-ADN features ultra-low noise receiver and transmitter circuits, and includes separate highly selective tracking filters for receive and transmit. The high dynamic range *full-duplex* single conversion superheterodyne architecture provides 25 KHz channels across the 225-400 MHz UHF band. An upgradable Software Defined Radio (SDR) digital signal processing (DSP) module provides all standard narrowband AM/FM functions. The multiple audio inputs and outputs all precisely match the ARC-171 I/O signals, as do the digital signals. Software gain control loops level the receive, transmit and external HPA signal levels to within preset tolerances.

The S171-ADN accepts the standard ARC-171 serial synchronous remote control scheme.

APPLICATIONS

LOS communications, wideband/high speed data links, point-to-point high speed communications.

Specifications subject to change without notice as we improve our products

For further information, contact: Softronics Ltd., 1080 East Post Road, Marion, IA 52302

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INSTALLATION CONSIDERATIONS

The S171-ADN is a direct form/fit/function replacement for the indicated ARC-171-1C receiver-transmitter models. A detailed Installation Control Drawing is available from the supplier upon request. However, the user should be aware of certain installation issues that may be encountered, specifically:

1. The S171-ADN is shipped WITH a mounting tray adapter and vibration isolators installed.
2. The S171-ADN has TWO input power connectors in the normal location on the front panel: a legacy AC power connector and a legacy DC power connector, plus separate circuit breakers for AC and DC. The user may connect the available power to the appropriate connector, per the legacy wiring/pin-out, and leave the other connector unterminated, or connect both power sources without conflict (AC precedence). The unused connector is disabled with no backfeed.
3. The S171-ADN can operate from one or three phase AC power. The legacy ARC-171 family requires THREE phase input power due to a much higher power dissipation.
4. The higher-efficiency S171-ADN has a quiet internal fan compared to the standard ARC-171 high-volume blower, so the loud audible whine of the blower will be missing during normal operation.
5. Four of the legacy coaxial connectors (miniature push-on connectors for J4 Rcv 70 MHz IF; J7 Xmt 70 MHz IF; J8 1 MHz Reference In/Out; and J9 1 MHz Reference out) are obsolete and out of production. The S171-ADN utilizes standard Type TNC coaxial bulkhead jacks for J4 and J7-9. If these auxiliary functions are used in the installation, the connector type on the wiring harness will have to be replaced, or an adapter fashioned using a legacy connector. An additional J12 is added for optimal simplex operation.
6. The S171-ADN is rated for normal operation from -20° to +55° C in a pressurized cabin.
7. The internal fan may be reversed or removed as needed to suit the cooling scheme for a particular installation. Refer to instruction book.
8. The S171-ADN is approximately 10 lbs lighter in weight than the legacy ARC-171-1C.

ADDED FEATURES

The standard S171-ADN contains the following added features, which do not affect standard operation:

- Ethernet control and monitoring capability (RJ45 port on rear panel of unit)
- Four LED indicators on the front panel show power, fault, key, RF status
- AC or DC power is accepted by a single radio version
- The transmitter has very low intermodulation distortion for modern data waveforms
- The mount holddown fasteners have been ergonomically redesigned for ease-of-use and safety
- Unit can be strapped for full duplex operation in narrowband or wideband modes, with independent receiver and transmitter using the J1 connector for transmit and the J2 connector for receive. The internal unit architecture is full-duplex.
- Is functionally equivalent to the S171-ADW when using the wideband 70 MHz mode
- The S171-ADN is a software-defined radio. The radio may be upgraded with different versions of software via the Ethernet interface.
- Tailorable passband characteristics by exchanging 70 MHz filters
- The radio interface and software are non-proprietary. The internal source code may be licensed for second/third-party customization.

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**SPECIFICATIONS****RECEIVER & TRANSMITTER COMMON PARAMETERS**

Frequency Range.....	225-400 MHz
Tuning Resolution.....	25 kHz steps
Internal frequency accuracy.....	±0.1 ppm (-20) to +60°C) options available
VSWR.....	3:1 max, <2.01 typical at tuned frequency
Preselection.....	High-Q electronically tuned filters
Noise figure.....	11 dB typical, 13 dB maximum
Maximum RF input without damage.....	+15 dBm
Input third-order intercept point.....	3 dBm typical, -3 dBm minimum
Narrowband bandwidths.....	25 KHz, 80 KHz (software-defined)
Wideband bandwidths.....	1.5 MHz, 0.5MHz centered on 70 MHz
Image rejection.....	70 dB minimum (>80 dB typical)
IF rejection.....	70 dB minimum (>80 dB typical)
LO level at RF input.....	-80 dBm maximum (-90 dBm typical)
Internally generated spurious.....	-100 dBm equivalent RF input typical

TRANSMITTER PARAMETERS

RF output.....	50 ohms nominal (reverse-N conn)
VSWR.....	Full power into 2:1; protected open or short
Postselection.....	High-Q electronically tuned filter
Power output.....	100 watts PEP and RMS
Duty cycle.....	Continuous
Third-order IMD (two 25 watt tones).....	-25 dbc typ
Harmonics, 100 watt carrier.....	-60 dbc
Spurious outputs, 100 watt carrier.....	-60 dbc typ
Narrowband bandwidths.....	25 KHz, 80 KHz (software-defined)
Wideband bandwidths.....	1.5 MHz, 0.5MHz centered on 70 MHz
IF input power for rated output.....	0+/-3 dBm
Gain control.....	-20 dB range (minimum)
Broadband output noise, 100 watt carrier	
10 MHz offset.....	-100 dBm/Hz typical
30 MHz offset.....	-120 dBm/Hz typical

CONTROL PARAMETERS

Serial control.....	1000 bps synchronous, per ARC-171-1C spec
Ethernet control/monitoring.....	10/100 Mbps, open architecture
External gain control.....	Per ARC-171-1C spec

PHYSICAL

Power input.....	AC: 85-250 vac, 1 OR 3 Phase, 47-420 Hz DC: 21-36 vdc MIL-STD-704
Power consumption.....	50 watts max receive, 500 watts max transmit
Weight.....	23 lbs (AC/DC)
Size.....	7H x 9W x 16.25L inches
Connectors.....	Identical to ARC-171-1C: type, location, rotation
IF & Freq Std RF connectors.....	TNC (replacing obsolete push-on connectors) Softronics will furnish custom TNC adapter cables on request
Operating temperature range.....	-20 to +55°C
Specified performance.....	25 ± 5°C
Non-operating temperature range.....	-40 to +70°C
Operating altitude.....	0 to 12,000 ft (0 to 3657 m)
Operating humidity.....	10 to 90% non-condensing
Crash Safety.....	30g
Vibration.....	Widebody standard
EMI.....	MIL-STD-461



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