



Technical Data Sheet

S171-EX

Full Duplex UHF

Datalink

Receiver-Transmitter

DIRECT REPLACEMENT* FOR:

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

NSN	Collins PN	Nomenclature	Power
5821-01-303-0504	622-1566-016	RT-1263(V)5	DC
5821-01-231-6440	622-1566-019	RT-1263(V)	DC
5821-01-301-6357	622-2143-014	RT-1270(V)2	AC
5821-01-194-8161	622-2143-018	RT-1270(V)2	AC

*Contact Softronics for information on tailoring the S171-EX to replace other versions of the ARC-171 family.

KEY FEATURES

- 225-400 MHz tuning range
- Simultaneous receive & transmit
- Form/fit/function replacement for ARC-171 -1H including adapter tray
- High linearity, low-noise 100 watt amplifier
- External +28 vdc regulated power input (optional accessory DC and/ or One/Three Phase 47-420 Hz AC internal power supplies available)
- Fast tracking preselector and postselector
- Ethernet and serial synchronous control
- 1.5 MHz bandwidth 70 MHz IF ports
- Quiet internal reversible/removable blower

DESCRIPTION

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

The S171-EX features ultra-low noise receiver and transmitter circuits for interference-free cosite operation, and includes separate highly selective tracking filters for receive and transmit. The high dynamic range single conversion superheterodyne architecture provides 25 KHz channels across the 225-400 MHz UHF band. The analog signal levels 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-EX accepts the standard ARC-171 serial synchronous remote control scheme.

The modular S171-EX is easily tailored to mission needs in power output, primary power, bandwidth, and frequency coverage. Contact Softronics.

APPLICATIONS

SATCOM communications, wideband/highspeed datalinks, point-to-point high speed communications.

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For further information, contact: Softronics Ltd., 100 35th St, Marion, IA 52302

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INSTALLATION CONSIDERATIONS - The S171-EX is a direct form/fit/function replacement for the indicated ARC-171 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-EX is shipped WITH a mounting tray adapter and vibration isolators installed.
2. The S171-EX has ONE DC input power connector and circuit breaker in the normal location on the front panel. *(With the optional internal power supplies available, the S171-EX may be equipped with one or both of 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. The unused connector is disabled with no backfeed).*
3. The S171-EX requires +28 vdc regulated primary power. *(With the optional internal power supplies available, the S171-EX becomes a S171-AC and can operate from ONE or THREE phase AC power, 90-250 vac per phase. The legacy ARC-171 family requires THREE phase 400 Hz input power due to a much higher power dissipation. Because of the reduced power, the S171-AC can operate from only ONE of the three phases normally wired to the AC input connector. In this case the standard three-phase plug and wiring harness is directly compatible; two of the phases will draw no power).*
4. The higher-efficiency S171-EX 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. Six of the legacy coaxial connectors (miniature push-on connectors for J3 Aux UHF Rcv Antenna; J4 Aux 70 MHz Rcv IF; J5 Rcv 70 MHz IF; J8 1 MHz Reference out; J9 1 MHz Reference In/Out; and J10 Xmt 70 MHz IF) are obsolete and out of production. The S171-EX utilizes standard Type TNC coaxial bulkhead jacks for J3-5 and J8-10. When the S171-EX is installed in an existing system, these connectors in the wiring harness will have to be replaced, or adapters fashioned using legacy connectors.
6. The S171-EX 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..
8. The S171-EX retains the Type REVERSE-N connector for J6, the transmitter output, as used on the legacy ARC-171 family to prevent cross-connecting of the receive and transmit antennas (due to a SATCOM preamplifier in line with the receive antenna). Note the difference when installing to prevent accidental damage.

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

1. Ethernet control and metering capability (RJ45 port on rear panel of unit)
2. Four LED indicators on the front panel show power, fault, key, RF status
3. AC or DC power is accepted by a single radio *(with optional internal power supplies)*
4. The transmitter has very low intermodulation distortion for modern data waveforms
5. The mount hold-down fasteners have been ergonomically redesigned for ease-of-use and safety
6. Tailorable passband characteristics by exchanging 70 MHz IF filters
7. The radio interface and software are non-proprietary. The supplier is willing to license the internal source code for second/third-party modification as a separate non-GSA item.

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SPECIFICATIONS

Parameter	Specification
RECEIVER & TRANSMITTER COMMON PARAMETERS	
Frequency range.....	225-400 MHz (extended ranges available)
Tuning resolution.....	25 kHz steps
Internal frequency accuracy.....	±0.1 ppm (-20 to +60°C); options available
Tune time.....	1 millisecond nominal
RECEIVER PARAMETERS	
RF input.....	50 ohms nominal
VSWR.....	3:1 max, <2.01 typical at tuned frequency
Preselection.....	High-Q electronically tuned filter
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
IF bandwidth.....	1.5 MHz (tailorable via IF filters)
IF center frequency.....	70 MHz
IF gain.....	+12 dB nominal gain above RF input
Gain control.....	Manual - 20 dB range (minimum)
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 connector)
VSWR.....	Full power into 2:1; protected open or short
Postselection.....	High-Q electronically tuned filter
Power output.....	100 watts CW
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
IF bandwidth.....	1.5 MHz (tailorable via IF filters)
IF center frequency.....	70 MHz center
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 legacy ARC-171 -1H spec
Ethernet control/monitoring.....	10/100 Mbps, open architecture
External gain control.....	Per ARC-171 -1H spec
PHYSICAL	
Power input.....	Ext. DC: 28 vdc regulated, 18 amps max (Opt. AC PS: 85-250 vac, 1 or 3 Phase, 47-420 Hz) (Opt. DC PS: 21-36 vdc MIL-STD-704)
Power consumption.....	30 watts max receive, 500 watts max transmit
Weight.....	18 lbs with EXTERNAL regulated 28 vdc supplied (no (24 lbs with opt. DUAL AC/DC power supply) (21 lbs with opt. 1 or 3 AC or DC power supply)
Size.....	7H x 9W x 16L inches
MIL Circular Connectors.....	Identical to ARC-171 -1H: type, location, rotation
IF & Freq Std RF connectors.....	TNC (replacing obsolete push-on connectors) Note: Softronics can furnish custom TNC adapter
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

Commented [D1]: This table is highlighted to indicate multiple edits, which Excel does not track well. Use the full table as edited.

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