

# VHF/UHF BASE/REPEATER TRANSCEIVERS FAMILY

## 400-4/K series



- ★ System oriented transceiver
- ★ Close frequency tolerance
- ★ RFI robustness
- ★ Environment endurable
- ★ Ferrite circulator option
- ★ Built-in battery charger
- ★ DVP option

**DESCRIPTION**

The 400-4 series transceivers are designed to meet the most sophisticated and severe specifications, encountered in Land Mobile and Fixed Radio communication network and systems:

- Close frequency tolerance
- High RFI rejection
- Environmental ruggedness
- Very high reliability

Besides, the 400-4 series fulfills very important requirements:

- System oriented concept
- Multipurpose application
- Easy on site servicing

Receiver's high sensitivity and wide dynamic range withstand an "unfriendly" electromagnetic environment. Hybrid modules, used in RF PA, provide a stable and reliable duplex operation.

For each frequency band an appropriate duplexer is available to fit in cabinet. On a multi users common repeater site special options are added to cope with crowded spectrum such as: ferrite circulators and/or external high Q band pass filters.

A well-suited service panel provides:

- Incident and reflected RF power monitoring
- Base station tone calling
- Easy selection of configuration: repeater or base station, intermittent or continuous carrier; 4-w or 2-w interface to other transmission media
- Socket for service handset

This series of transceivers is system supported with a family of remotely (via radio) controlled "combining" equipment - AKU-400 series enabling different "special features":

- Operating/Stand-by (1+1) pair with change-over on transceiver's or on unit's level (Tx, Rx)
- Reconfiguration of a multi-transceiver mode
- Working/Stand-by and reconfiguration feature

An appropriate adapter is available for long-distance control, through a MUX channel. The control is carried-out by a DK-600F or RRC 600, using reversal connection of the same adapter interface (AR/4L).

Built-in power supply provides +13,5V constant voltage source and also charges the external rechargeable 12V batteries (up to 60Ah).

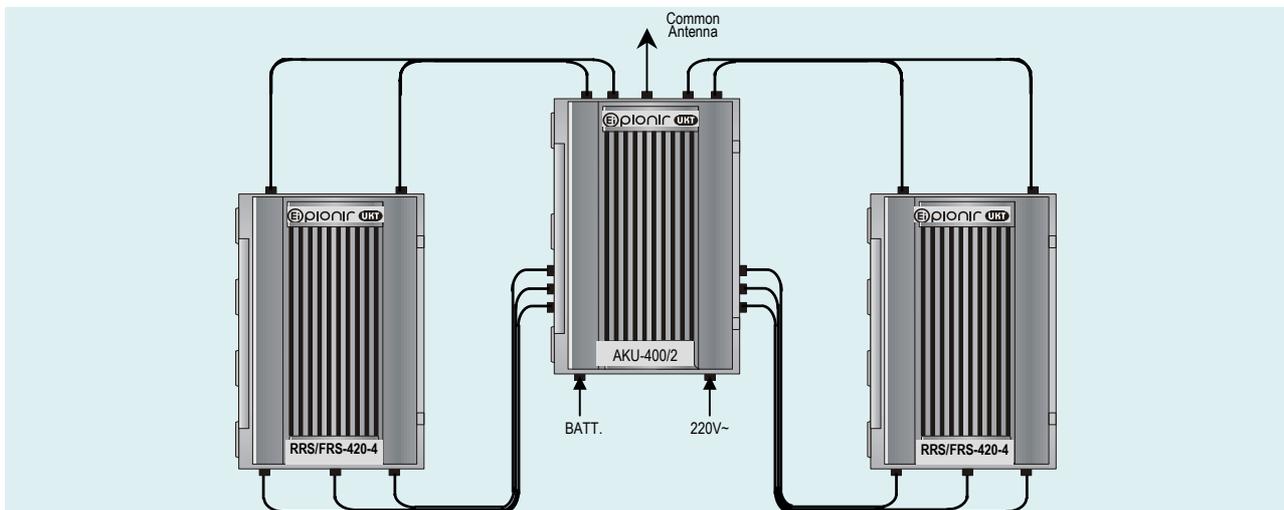
Basic RF units - receiver and transmitter's exciter - are efficiently screened for internal EMC.

*Built-in **DVP Modem** converts standard repeater for analog voice retransmission into "mixed type" for both - digitized and analog voice retransmission, automatically switching it's mode of operation by incoming signal. It should be emphasized that no on site decrypting action take place, but a retranslation of the incoming modulation. This option is marked as **400-4/K**.*

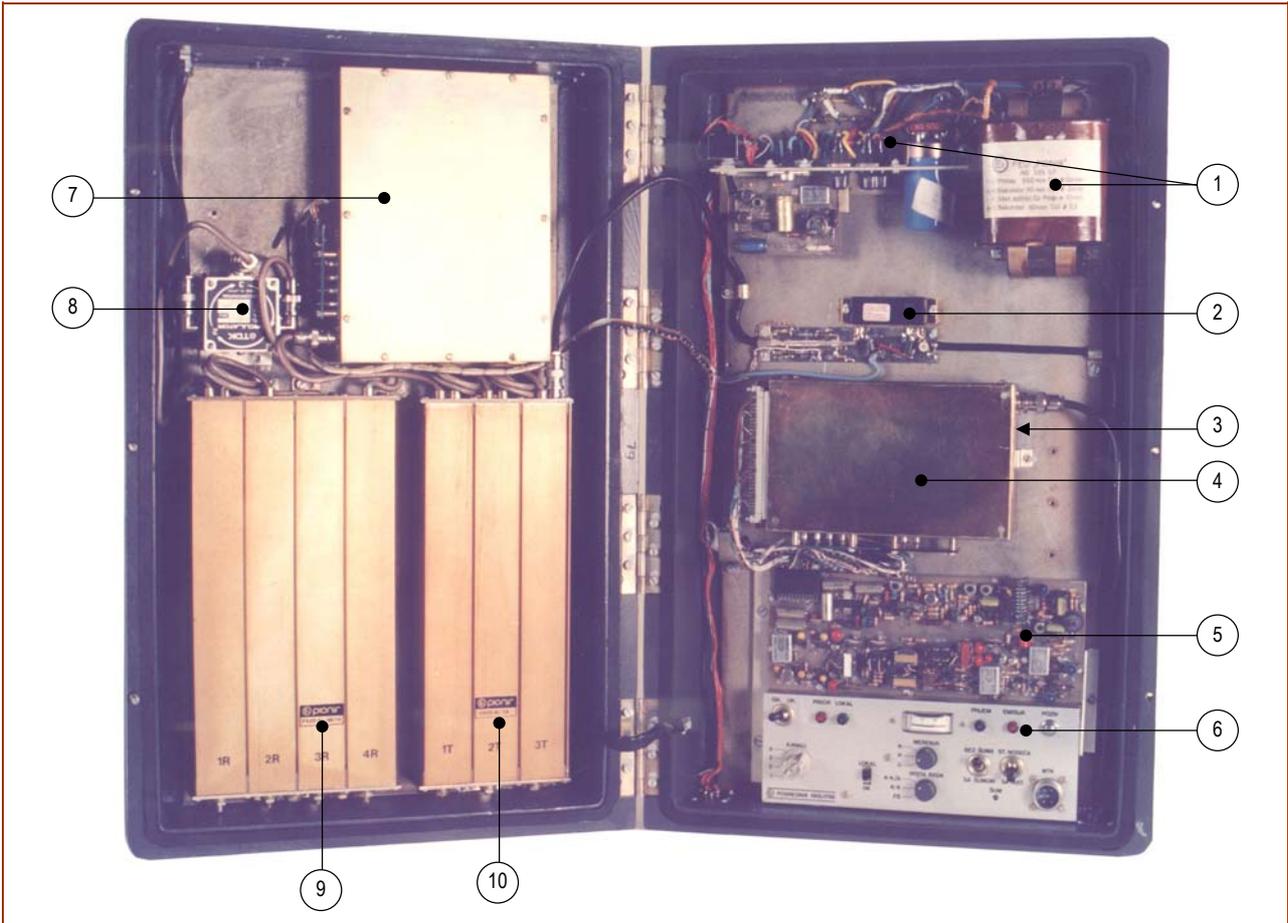
Back-to-back connection of two 400-4 transceivers is carried out by a simple interface cable for analog transmission.

When used in Base Station's configuration, the 400-4 transceiver is connected to DK-600F (or DK-600F/K) control console or to high capacity multiprocessor Base control and switching system (RRC-600).

Cast from aluminum alloy, rugged and waterproof cabinet protects electronic circuit from dust and moisture, often encountered on unattended repeater sites.

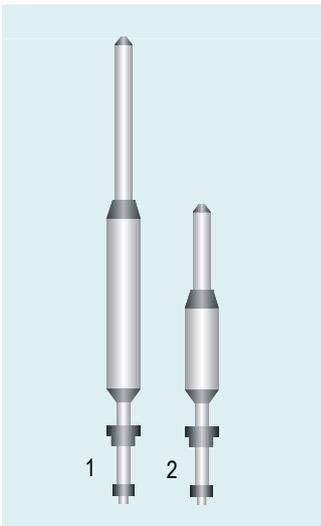


2-m band Repeater site "1+1"; Change-over on the Unit level

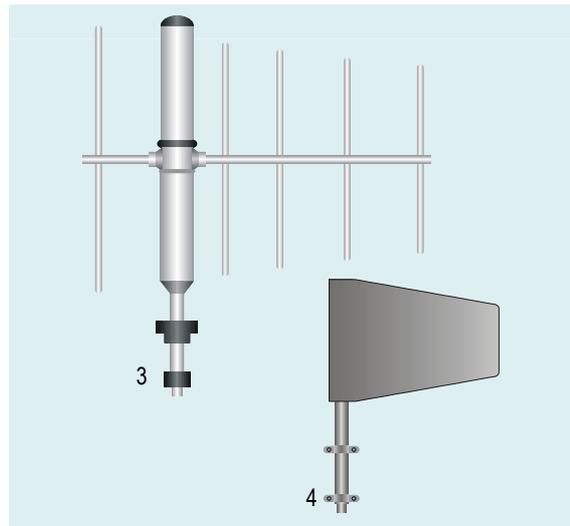


*Repeater Equipment RRS/FRS-420-4/K opened*

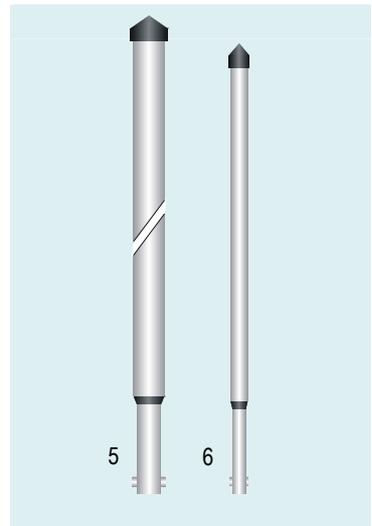
1- Power Supply and Battery Charger; 2- Output RF Amplifier Module; 3- Transmitter's Exciter; 4- DVP Modem; 5- AF part; 6- Service Panel; 7- Receiver; 8- Ferrite Circulator; 9- Receiver Section of Duplexer; 10- Transmitter Section of duplexer



**Wide Band Dipole**  
 1) - WD-SZ-20, VHF band  
 2) - WD-SZ-7, UHF band



**Directional Antenna (6-element Yagi)**  
 3) - UAJ-20/9, VHF band; 9dB<sub>D</sub>  
 4) - UAJ-07/9, UHF band; 9dB<sub>D</sub>

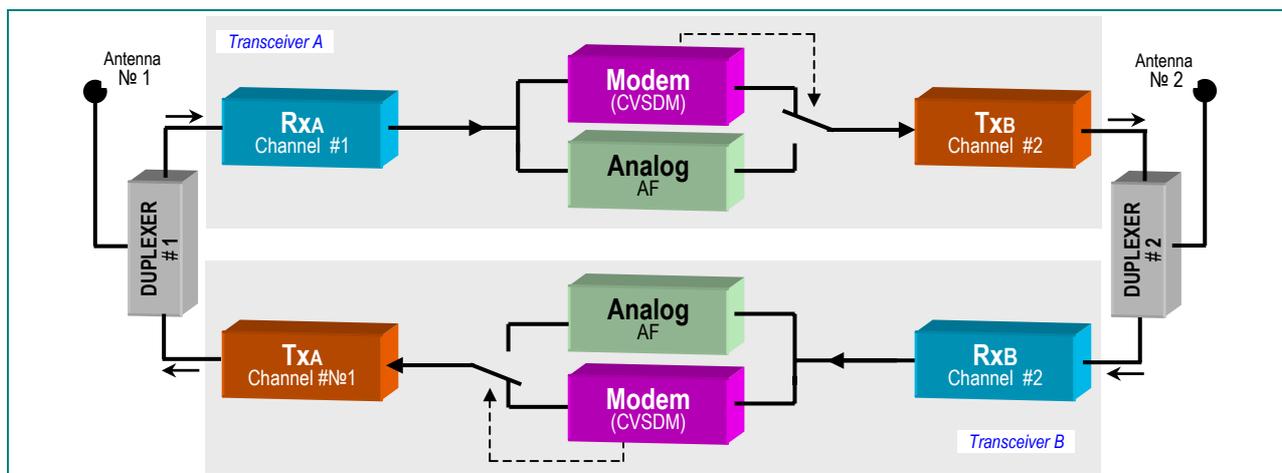


**Omnidirectional Array**  
 5) - HDR-20/4,5, VHF band, 4.5dB<sub>D</sub>  
 6) - HDR-07/4,5, UHF band, 4.5dB<sub>D</sub>

**TECHNICAL SPECIFICATIONS**

<b>GENERAL</b>				
Type	RRS/FRS-407-4	RRS/FRS-420-4	RRS/FRS-440-4	
Operating meter band	0,7	2	4	
Frequency range (MHz)	410÷470	146÷174	68÷88	
Number of channels	1÷4			
System rated channel spacing (kHz)	25			
Operation mode	Repeater/Base Station (D/SD or S)			
D and SD frequency separation (MHz)*	10; 8	4,5; 4,6	4,5	
Class of emission	16G3E; 16K3E			
Temperature range (°C)	-25 to +55			
Frequency stability (ppm)	±2	±2,5	±2,5	
Supply voltage	220VAC and/or 13,5VDC, negative ground			
Dimensions (mm)	WHD: 360x560x125			
Weight, app. (kg)	14			
* - Standard values; may be altered				
<b>TRANSMITTER</b>				
Output RF power**	20W±1dB	20W±1dB	20W±1dB	
Tolerable SWR (50Ω)	1:2			
Spurious signals (dBc)	Better than -64			
Switchable bandwidth (MHz)	12	3,5	1,6	
Maximum rated system deviation (kHz)	±5 analog; ±4,8 digital			
Audio-frequency response (300 to 3000Hz)	+1dB to -1dB resp. +6dB/oct			
Total harmonic distortion (%)	< 5			
<b>RECEIVER</b>				
Sensitivity (µV)** for:	12dB SINAD	0,5	0,35	0,35
	5x10 <sup>-5</sup> BER	0,8	0,55	0,55
Adjacent channel selectivity (dB)	Better than 80			
Intermodulation rejection (dB)	Better than 70	Better than 70	Better than 70	
Spurious response rejection (dB)**	Better than 70	Better than 80	Better than 80	
Spurious radiations (nW)	< 2			
** - including duplexer or pre-selector (Simplex)				
<b>AF LEVELS (Analog-in; out)</b>				
Handset	8mV/200Ω; 2mW			
4w/600Ω	in: -8÷0dBm; out: -4÷0dBm			
2w/600Ω	in: -4dBm; out: +5dBm			

- May be changed without notice -



Retransmission (Relay) Station, linking two Repeaters (chan. #1 and chan. #2)