IBS-1 Automatic Band Decoder

The IBS-1 Intelligent Band Switch is designed to provide flexible, intelligent automatic control of antennas in one and two transceiver environments. The unit runs off of 12 volts and interfaces directly to Yaesu and Icom transceivers. It also interfaces to the band-data outputs generated by many logging and contest programs for Kenwood radios, which have no band data output jack.

The unit has 10 antenna outputs that can be configured in a number of different ways. The outputs from the IBS-1 Controller are 12 volt DC and source up to 300 milliamps. Optional relay boards are available for applications that require sinking or different voltages. The relay boards are available in Single Radio format and in a Dual Radio Format. The Controller measures 6"w by 3"h by 2"d (15x8x5.5cm) and fits nicely on top of the transceiver.

The unit is powered by 12 volts DC and allows automatic or manual selection of a number of antennas. In addition to nine auto/manual antenna outputs, there is a "Special" output that can be used for a dummy load or a reference antenna.

Installation of the IBS-1 is straightforward. If you are installing the IBS-1 without the Relay driver option, refer to the next section.

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Here are the basic installation steps:

1. Open the Controller Unit and configure the jumpers as you require for your installation. The factory setting is one relay per band (1-9 = 160 through 10).
2. Connect the external antenna wiring to the appropriate terminals on the antenna switch for each
radio. Note that Relay Circuit #10 is for a "special" antenna, e.g., a dummy load. You can select this output at any time by pressing the "SPECIAL" button on the front panel of the controller unit.
3 .If the IBS-1 is to be used with an FT-1000x, plug in the provided connector from the appropriate controller to the "Band Data" jack on the FT-1000x. No other settings are required for Yaesu FT-1000x use.
4 .If the IBS-1 is to be used with Icom, use a 1/8" single circuit jumper cable to plug in to the CIV output (Remote or one of the available jacks on the CIV interface module, if you have an older CI-V interface you can buy a Y adapter cable from Radio Shack for this purpose.) Configure the Baud Rate on the ICOM for either 1200 or 9600. The IBS-1 is jumpered from the factory for 9600 baud. These are the only two baud rates available.
5. Apply power to the system.

Installation IBS-1 Directly to Antenna Relay Box or through the Relay Driver Option box.

Installation of the IBS-1 is straightforward. There are ten outputs that source 12 volts DC to ground.
There is a 12 conductor cable that is used to interface to the antenna relay unit (such as the Array Solutions SixPak). Configuration jumpers are provided that control which leads are activated on various bands.
Each output is able to source up to 300 milliamps and is protected against short circuit conditions.
Important note: the IBS-1 requires that at least 100 milliamps be drawn from the active output. Also, we STRONGLY discourage using the IBS-1 outputs to drive cables outside the operating area. If the antenna switch is located outside the operating area, the "Level Converter and Relay Driver Option" should be used from Array Solutions. It will re-drive from up two IBS-1s (or 12 signals) to a SixPak or remote antenna switches. It also provides a great little junction box to integrate your cables for bandpass filters as well as the SixPak to help make the cable terminations easy.

For dual radio installations (SO2R), you must assure that the relays are "interlocked" so that you cannot select the same band for both radios. The Array Solutions Relay Driver Option Box does this very well when couples with the WX0B SixPak. If you use bandpass filters in addition to the antenna selectors the best solution for this is to use the Relay Driver Option Box. Wire the outputs of the IBS-1 to the input terminals of the Relay Driver Option box, this will allow the IBS-1 to sense the current being drawn by the bandpass filter relays (the Array Solutions FM-6 product). Then wire the SixPak or antenna switches to the output

of the Relay Driver Option. You can drive a considerable distance with this by upping the +V DC supplied to this box say to 16V DC if you like.

Here are the installation steps:

1.The 12VDC power is connected to the Black wire (ground) and Pink wire (12VDC).

2.The outputs 12 volt sourcing. If 12 volt sinking is required (ground common) then you must use the Relay Option Board configured to be a Level Converter, or provide relays of your own. Connect the wires to the input terminal strip of the Relay Driver/level converter box.

3.Open the Controller Unit and configure the jumpers as you require for your installation. The factory setting is one relay per band (1-9 = 160 through 10). (NOTE-This is the most likely setting for contesters even if you use a tri-band antenna, so that you can chose the proper bandpass filter. Use steering diodes to select the tri-bander. This is easy and we have a diagram for you if needed on how to do this.)

4.Connect the output drive antenna wiring to the appropriate terminals on the Relay Driver input terminals.
Note that Output #10 is for a "special" antenna, e.g., a dummy load. You can select this output at any time by pressing the "SPECIAL" button on the front panel of the controller unit.

4.a If bandpass filters are used connect 12V sourcing filters to the input terminals of the Relay Driver Box. The IBS-1needs to see 100ma being drawn from it. The Array Solutions FM-6 matrix for filters satisfies this requirement. If you use a Sinking band pass filters such as the ICE 419A units you must configure the system with a Level converter Box to drive sinking current to the 419As. Place the Antenna Relay on the input terminals (12V source) and the 419As on the output of the Level Converter box. You can call us for detailed information on this if needed. Basically we have the parts to configure the IBS-1 to take care of all the commonly configurations of commercial antenna switching and bandpass filtering.

5. See comments above for connecting to the radios band data jacks.

6. Outputs from the Relay Driver Option Box, if used, should go to the appropriate antenna terminals of the antenna switch. Other wise connect the IBS-1 outputs directly to the antenna switch if inside the shack.

7.Apply power to the system. See the section below for operational details.

Power/Relay Cable Wire Colors (Refer to Configuration Jumper Data)

Output	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
Wire Color	Brown	Red	Orange	Yellow	Green	Blue	Violet	Grey	White	Tan

Operation

The IBS-1 is simple to use. It automatically senses the band you have chosen and drives the relays as instructed by the jumper settings inside the unit. If you try to select a band that is already in use by the other radio, the IBS-1 indicates "Er" (in some configurations) and waits for you to select another antenna. If you move the second radio off the conflicting band, the IBS-1 automatically corrects the problem and reselects the originally selected antenna.

ICOM notes: for ICOM, the IBS-1 is able to sense ALL bands, including 30 meters, 17/15/12/10 and six meters. It does this by monitoring the CIV communication. There are a few things to keep in mind for ICOM:

1. When first powered on, you must cause the ICOM to output its band data. Do this by **twisting the tuning knob or by changing bands**. Until you do this, it will sit on 160M.

2. When using remote control software, a band change may or may not trip the IBS-1. Again, a slight tweak of the tuning knob will update the outputs. CT is known to require this operation.

3. Be sure your baud rate is set correctly. The IBS-1 will not work unless it is.

User Interface

The IBS-1 has five 7-segment displays. The first three of these indicate the selected band. The right of pair of these displays indicate the selected antenna. When in automatic operation, the antenna number (1-9) is indicated with the letter A followed by the antenna number. The "A" is not there when manual operation is selected via the front panel switch.

For manual operation, flip the front panel switch to manual. You can then manually select the antenna you want by pressing the "SELECT" button. It cycles from 1 though 9.

The IBS-1 supports a "SPECIAL" position. When you press the "SPECIAL" button, antenna relay #10 is selected. This can be used for a dummy load (most common application). It can also be used to select a special antenna of some kind.

In use, the Auto/Manual and the SPECIAL controls can be used to quickly switch back and forth between alternate antennas.

IBS-1 Configuration Jumpers

CFG	Jc	Jb	Ja	R1	R2	R3	R4	R5	R6	R7	R8	R9
0	OUT	OUT	OUT	160	80	40	30	20	17	15	12	10
1	OUT	OUT	IN	160	80	40	20	15	10	20 15 10	17 12 6	30
2	OUT	IN	OUT	160	80	40	20	15	10	20 15 10	NA	30 17 12 6
3	OUT	IN	IN	160	80	40	20	15	10	NA	20 15 10	30 17 12 6
4	IN	OUT	OUT	160	80	40	20	15	10	NA	20 17 15 12 10 6	30
5	IN	OUT	IN	160	80	40	20	15	10	20 15 10	30 17 12	6

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6	NA											
7	NA											

How the configurations are used:

Configuration Zero (0):

This is the "pure" configuration. Each of the nine amateur bands are assigned to an individual relay. Filters and antenna relays are connected as required for each separate band.

Configuration One (1):

This configuration is used at stations that have a tri-bander for 20-15-10 meters, and a separate antenna for 17-12-6 meters. Filters can be connected to the band outputs. For the tri-bander, connect the R7 output to the antenna relay.

Configurations Two (2) and Three (3):

These configurations are provided to simplify two radio installations that use tri-banders. The first radio should use Configuration 2, and the second should use Configuration 3. The tri-bander for Configuration 2 will be on R7, and the tri-bander for the Configuration 3 will be on R8. As a result, the radios will automatically go to different antennas when 20-15-10 are selected.

Configuration Four (4):

This configuration is also provided for two radio installations (and for stations using log periodics or verticals). The first radio should be set to a configuration as necessary (do not use Configuration 3 to keep R8 available). All bands from 20 through 6 meters will be selected on R8 in this configuration. Again, relays 1-6 can be used to select filters for the traditional six amateur bands.

Configuration Five (5):

This configuration is provided for stations that have a tri-bander for 20-15-10 R7), and a WARC tri-bander for 30-17-12 (R8) and a separate antenna on six meters (R9).

Configurations Six (6) and Seven (7):

These configurations are not assigned.
NOTE - When using configuration 1 through 5 any band combinations using R7,R8, or R9. The other output wire that formally had been used for band output would need to be grounded through a 270 ohm, 1/2 watt resistor.

Also when using the Array Solutions Level Converter (Re-Drive box) to re-drive 12VDC relay lines out of doors, a 270 ohm again is needed on all the IBS-1 output lines being used. It is easy to place them inside the Re-Drive box

Thank you for selecting the IBS-1 from RF Applications.

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